

## Crustacea Decapoda: Deep water Xanthoidea from the South-Western Pacific and the Western Indian Ocean

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### ABSTRACT

Twenty-two species of xanthoid crabs, living mostly at depths greater than 200 m, are recorded from waters off New Caledonia, and some other Southwest Pacific localities. Of these 13 species are new, and one new genus is defined. They include : *Gaillardiellus bathus* sp. nov.; *Meractaea multidentata* sp. nov.; *Rata chalcal* sp. nov.; *Alainodaeus alis* sp. nov.; *Alainodaeus nuku* sp. nov.; *Palatigum trichostoma* gen. nov., sp. nov.; *Medaeops gemini* sp. nov.; *Medaeops merodontos* sp. nov.; *Medaeus aztec* sp. nov.; *Paramedaeus megagomphios* sp. nov.; *Liomera nigrimanus* sp. nov.; *Euryxanthops latifrons* sp. nov.; and *Xanthias teres* sp. nov. Other species have had their geographic and bathymetric ranges increased. An additional species *Euryxanthops cepros* sp. nov. is described from the Seychelles Archipelago, and is the first species of this genus to be found in the Indian Ocean. Keys for identification are provided for the species of *Alainodaeus*, *Euryxanthops*, *Medaeops*, *Medaeus*, and *Paramedaeus*.

### RÉSUMÉ

**Crustacea Decapoda : Xanthoidea d'eau profonde du Sud-Ouest Pacifique et de l'océan Indien occidental.**

Vingt-deux espèces de crabes Xanthoidea, vivant pour la plupart à plus de 200 m de profondeur, sont signalées de la Nouvelle-Calédonie et de quelques autres localités du Sud-Ouest Pacifique. Treize de ces espèces sont nouvelles et un genre nouveau est décrit, qui sont *Gaillardiellus bathus* nov.; *Meractaea multidentata* sp. nov.; *Rata chalcal* sp. nov.; *Alainodaeus alis* sp. nov.; *Alainodaeus nuku* sp. nov.; *Palatigum trichostoma* gen. nov., sp. nov.; *Medaeops gemini* sp. nov.; *Medaeops merodontos* sp. nov.; *Medaeus aztec* sp. nov.; *Paramedaeus megagomphios* sp. nov.; *Liomera nigrimanus* sp. nov.; *Euryxanthops latifrons* sp. nov.; et *Xanthias teres* sp. nov. Les autres espèces voient leurs répartitions géographique et bathymétrique étendues. Par ailleurs, *Euryxanthops cepros* sp. nov. est décrite des îles Seychelles et est la première espèce de ce genre trouvée dans l'océan Indien. Des clés d'identification sont proposées pour les espèces des genres *Alainodaeus*, *Euryxanthops*, *Medaeops*, *Medaeus*, and *Paramedaeus*.

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## INTRODUCTION

DAVIE (1993) described the deepwater of the central and southern Pacific Ocean as "a treasure-house of new taxa". In that paper he described 10 new species from French Polynesia, and four new genera to accommodate them. The present paper is mostly concerned with the New Caledonian region, including the Loyalty Islands, and southwards along the Norfolk Ridge. The investigation of the bathyal zone of this region has been quite extensive with many cruises having now been completed viz. CHALCAL 1 & 2, BIOCAL, MUSORSTOM 4-6, SMIB 1-8, BATHUS 1-3, VOLSMAR, AZTEQUE, GEMINI and BERYX 2 (for cruise reports see RICHER DE FORGES, 1990, 1993a; RICHER DE FORGES & CHEVILLON, 1995). RICHER DE FORGES (1993b) has provided an extensive bibliography of the research and reports that have been published on all aspects of the deepwaters of New Caledonia.

A small collection from French Polynesia, not previously seen by DAVIE (1993) has also been included. Cruise reports and more extensive collection details for these specimens are given by POUPIN (1991). Also, a collection made during the MUSORSTOM 7 cruise to Wallis and Futuna Islands (see RICHER DE FORGES & MENO, 1993) has been studied.

The specimens entrusted from the Seychelles were caught in a trap set in deep water as part of a trapping program that was undertaken in 1987 by the CEPROS Cruise. One of the aims of this expedition was to investigate the potential for a deep water shrimp fishery in the waters of the Seychelles Plateau. A report detailing the methods, stations, and results has been published (INTÈS & BACH, 1989).

Measurements in millimeters (mm) are usually of carapace breadth (c.b.) (measured at the widest point) followed by length. Both measurements are given for all new taxa but for specimens belonging to an already described taxon, often only a single measurement of carapace breadth has been given, especially where there were many specimens.

Abbreviations used in the text are : AM, Australian Museum, Sydney; MNHN, Muséum national d'Histoire naturelle, Paris; QM, Queensland Museum, Brisbane; USNM, Smithsonian Institution, United States National Museum, Washington. Often the station numbers are prefixed by the following abbreviations : CAS = casier (trap); CH = chalut à panneaux (Otter trawl for fish); CP = chalut à perche (beam trawl); D = drague (dredge); DW = drague Waren (Waren dredge).

The abbreviated terminology used for carapace regions is that used by SERÈNE (1984) following DANA (1852). The classification used in this work follows that of SERÈNE (1984) with recent nomenclatural changes and additions incorporated, in particular I have followed HOLTHUIS (1993 : 619) in recognising the seniority of the Oziidae Dana, 1852, over the Menippidae Ortmann, 1893.

## LIST OF SPECIES

## Family OZIIDAE Dana, 1852

## Subfamily Eriphiinae Alcock, 1898

*Globopilumnus laciniatus* (Sakai, 1980)

## Family XANTHIDAE MacLeay, 1838

## Subfamily Actaeinae Alcock, 1898

*Gaillardius bathus* sp. nov.

*Meractaea multidentata* sp. nov.

*Rata chalcal* sp. nov.

## Subfamily Antrocarcininae Ng &amp; Chia, 1994

*Antrocarcinus petrosus* Ng & Chia, 1994

## Subfamily Euxanthinae Alcock, 1898

*Alainodaeus alis* sp. nov.

*Alainodaeus nuku* sp. nov.

*Alainodaeus rimatara* Davie, 1993

*Palatigum trichostoma* gen. nov., sp. nov.

*Medaeops gemini* sp. nov.

*Medaeops merodontos* sp. nov.

*Medaeus aztec* sp. nov.

*Miersiella haswelli* (Miers, 1886)

*Paramedaeus globosus* Serène & Vadon, 1981

*Paramedaeus megagomphios* sp. nov.

*Paraxanthodes cumatodes* (MacGilchrist, 1905)

## Subfamily Liomerinae Sakai, 1976

*Liomera nigrimanus* sp. nov.



Subfamily Xanthinae MacLeay, 1838  
*Demania intermedia* Guinot, 1969  
*Demania mortenseni* (Odhner, 1925)  
*Demania wardi* Garth & Ng, 1985

*Euryxanthops latifrons* sp. nov.  
*Euryxanthops cepros* sp. nov.  
*Xanthias teres* sp. nov.

## SYSTEMATICS

XANTHOIDEA MacLeay, 1838

Family OZIIDAE Dana, 1852

Subfamily ERIPHIINAE Alcock, 1898

Genus **GLOBOPILUMNUS** Balss, 1933

*Globopilumnus laciniatus* (Sakai, 1980)

*Pilumnus spongiosus* - RATHBUN, 1923 : 111 [not *Pilumnus spongiosus* Nobili, 1905].

*Planopilumnus spongiosus* - BALSS, 1933 : 40.

*Pilumnus laciniatus* Sakai, 1980 : 76-77.

*Globopilumnus multituberosus* Garth & Kim, 1983 : 689-690, fig. 6. — NG & TAN, 1985 : 127-129, fig. 1.

*Globopilumnus laciniatus* - NG, 1992 : 221.

**MATERIAL EXAMINED.** — **New Caledonia.** MUSORSTOM 4 : stn 179, 18°56.6'S, 163°13.7'E, 475 m, 18.9.1985 : 1 ♀ 9.1 mm (MNHN-B 22739). — Stn 223, 22°57.0'S, 167°30.0'E, 545-560 m, 30.09.1985 : 1 ♂ 7.6 mm (MNHN-B 22740). — Stn 238, 22°13.0'S, 167°14.0'E, 500-510 m, 02.10.1985 : 1 ♂ 6.0 mm (MNHN-B 22738).

**Loyalty Islands.** MUSORSTOM 6 : stn DW 487, 21°23.3'S, 167°46.4'E, 500 m, 23.02.1989 : 1 ♀ 4.4 mm (MNHN-B 22741).

**Norfolk Ridge.** BATHUS 3 : stn CP 833, 23°03'S, 166°58'E, 442 m, 30.11.1993 : 1 ♂ 5.8 mm; 1 ♀ 6.5 mm (QM-W20585). — Stn CP 846, 23°03'S, 166°58'E, 500-514 m, 01.12.1993 : 2 ♂ 6.3, 6.7 mm; 4 ♀ 6.1, 6.4, 7.0, 7.9 mm (MNHN-B 22737).

**REMARKS.** — These specimens agree closely with the descriptions and figures of GARTH & KIM (1983) and NG & TAN (1985). The dorsal carapace is, in life, covered with a close tomentum that obscures the characteristic tuberculation, and makes the anterolateral teeth appear like broad blunt lobes. Only after careful cleaning does its identity become obvious.

**DISTRIBUTION.** — Philippines and Honshu Island, Japan (type series); New Caledonia; Norfolk Ridge; and Victoria, south-eastern Australia. Bathymetric range : 260-625 m.

Family XANTHIDAE MacLeay, 1838

Subfamily ACTAEINAE Alcock, 1898

Genus **GAILLARDIELLUS** Guinot, 1976

*Gaillarduellus bathus* sp. nov.

Figs 1, 15c

**MATERIAL EXAMINED.** — **New Caledonia.** SMIB 5 : stn DW 70, 23°40.6'S, 168°01.1'E, 270 m, 07.09.1989 : 1 ♀ 19.2 x 13.7 mm (MNHN-B 22772). — Stn DW 71, 23°41.3'S, 168°00.7'E, 265 m, 07.09.1989 : 1 ovig. ♀ 14.9 x

10.9 mm (USNM Unreg.). — Stn DW 75, 23°40.9'S, 168°00.8'E, 270 m, 07.09.1989 : 1 ♂ 18.7 x 14.3 mm (MNHN-B 22771).

BATHUS 3 : stn CP 806, 23°42'S, 168°01'E, 308-312 m, 27.11.1993 : 1 ♂ 13.8 x 10.3 mm (QM-W20581).

TYPE SPECIMENS. — The largest male (MNHN-B 22771) is the holotype, all other listed specimens are paratypes.

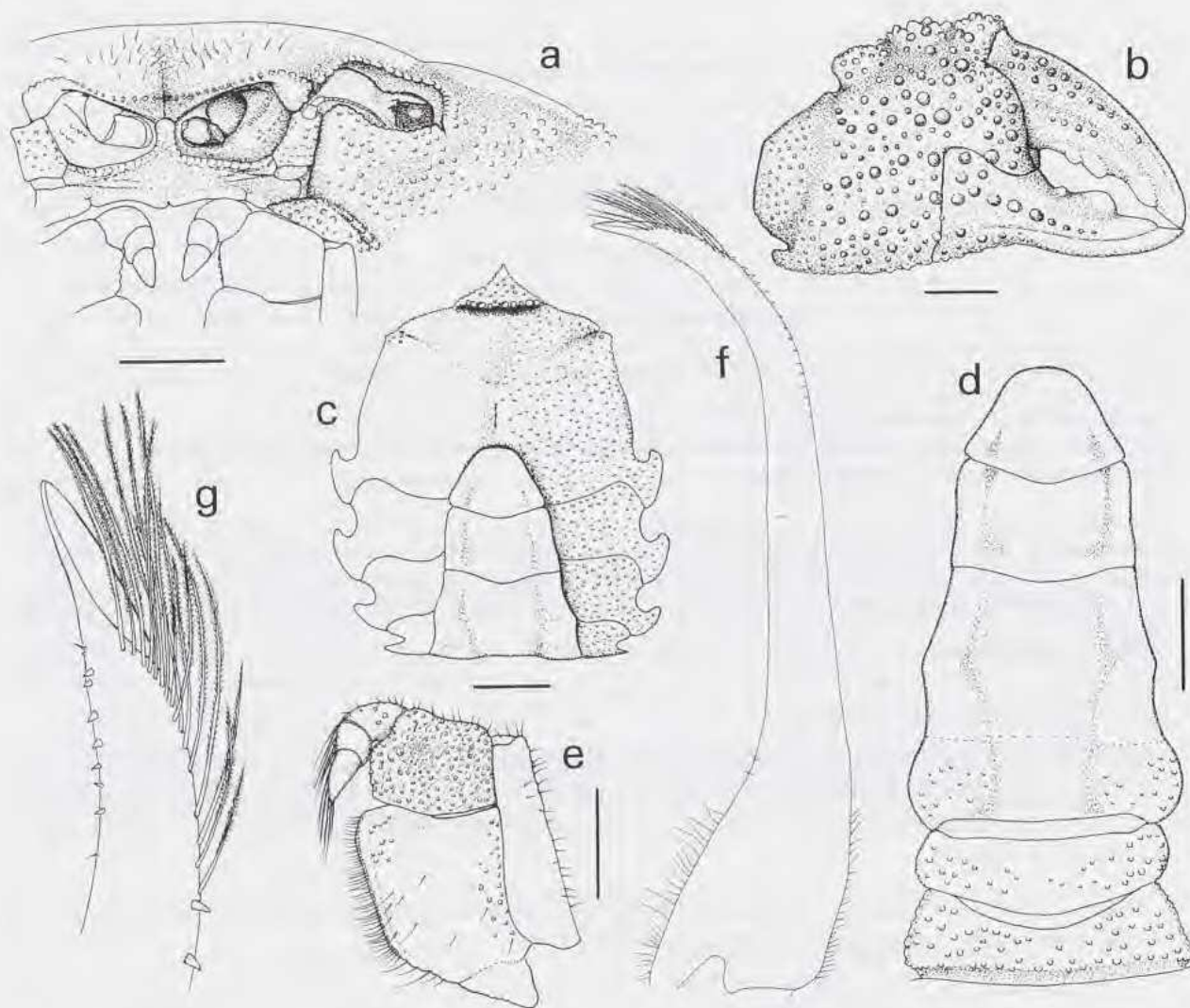


FIG. 1. — *Gaillardieillus bathus* sp. nov., holotype : a, frontal view; b, right chela; c, sternum; d, abdomen; e, third maxilliped; f-g, first gonopod and enlargement of tip. Scale line = 2 mm.

DESCRIPTION. — *Carapace*. Ovoid, c. 1.3-1.4 times broader than long; convex anteriorly, and moderately convex from side to side. Dorsal surface evenly covered in rounded granules except for smooth inter-regional furrows; minute, stiff, brown setae, about height of granules, over most of surface, less distinct in furrows; scattering of long, stiff, erect, brown setae. Regions distinct; separated by shallow furrows; 1F, 2F and 1M not distinctly separated from each other; 2M longitudinally divided, outer part longer and slightly wider; 3M entire, anterior projection narrow; 4M not distinct; 1P (cardiac) broad, well separated; 2P (intestinal) separated from cardiac by very broad smooth furrow; posterior margin not costate; postero-branchial regions mildly excavated.



Anterolateral margins regularly convex; consisting of 4 low, but distinct, evenly separated, granular lobes behind blunt exorbital angle. Front deflexed, *c.* 0.3 times carapace width; frontal margin granular; with broad, markedly projecting, median lobes; laterally concave; subacute lateral angles well separated from orbit. Upper orbital border evenly concave, median and lateral fissures closed, vestigial; lower orbital border concave medially, with large rounded inner lobe; narrow lateral fissure. Basal antennal segment touching front; granular; antennal flagellum short, reaching laterally to about proximal margin of cornea. Antennule with flagellum short, swollen, folding obliquely.

*Third maxilliped.* Length of merus *c.* 0.8 times width; *c.* 0.6 times length of ischium; surface finely granular, setiferous. Ischium rectangular, *c.* 1.2 times longer than wide; granular near interno-distal edge and along external lateral margin, otherwise smooth.

*Chelipeds.* Subequal, robust, moderately large; palm height *c.* 0.6 times length of palm including fixed finger. Merus short and broad; with posterior border coarsely granulate, bearing broad, blunt subdistal lobe, unarmed terminally. Carpus with inner angle not produced into a tooth, small granular prominence ventrally; upper surface of carpus covered with rounded granules; broad median longitudinal sulcus. Outer surface of palm coarsely granular; granules continuing in row over proximal half of fixed finger. Fixed finger with ventral submarginal groove; cutting margin with large rounded molar medially. Outer surface of palm covered, like carapace, in both short and long, stiff, simple setae. Inner surface of palm smooth behind gape, otherwise granular. Ventral border of chela concave at base of fixed finger. Dactylus with large granules proximally, diminishing distally. Fingers with tips cusp-like. Fingers dark-brown; colour extending only a little onto palm in females, but in large males colour of fixed finger rising up obliquely behind gape and extending backward for about one-third of length; similarly on inner face.

*Walking legs.* Relatively short, stout; first pair the longest. Merus of third leg *c.* 1.9 times longer than wide; carpus *c.* 1.5 times longer than wide; propodus *c.* 1.2 times longer than wide; dactylus longer than propodus. Dactyli curved, terminating in acute chitinous recurved tips. Superior margins and dorsal exposed faces of all segments coarsely granular, otherwise unarmed. Carpi with broad, smooth, sub-dorsal sulcus on upper surface. Setation as on carapace and chelipeds, but long setae more abundant.

*Abdomen.* Male abdomen relatively narrow; segments 3-5 fused. First segment about same width as third. Segments 3-5 sinuous, laterally angled at junction of segments 4/5. Segment six *c.* 1.7 times wider than long. Telson longer than sixth segment; *c.* 1.3 times wider than long; rounded. Female abdomen relatively narrow, not covering sternum. Females carrying large numbers of small eggs.

*Gonopods.* Male G1 long, curved, tapering; with long finely plumose setae on disto-dorsal margin (Fig. 1f-g).

*Sternum.* Relatively narrow, coarsely granular; telson reaching less than half length of fused sternites 3 and 4; suture between sternites 3/4 more-or-less distinct across whole width.

ETYMOLOGY. — Named in reference to the cruise on which one of the specimens was collected and also because this is the only species of *Gaillardiellus* known to live in the bathyal zone. It is used as a noun in apposition.

REMARKS. — This species is extremely similar to *Gaillardiellus rueppelli* (Krauss, 1843). It differs most obviously by the shape of the male abdomen with its short broad telson, and the sixth segment which is noticeably broader than long and not subquadrate as in *G. rueppelli*. Other differences are: the dorsal carapace areolation is lower and less strongly defined, with the grooves between the regions being shallower; the granulation is slightly finer; the transverse groove between sternites 3 and 4 is much less deeply marked; and the chelipeds have a strong bluntly rounded tooth medially on the cutting margin of the fixed finger. These differences apply equally to *G. orientalis* (Odhner, 1925), the other species close to *G. rueppelli*. Additionally *G. orientalis* has tufts of long, plumose setae symmetrically distributed on some regions, especially 2M and 1M.

The armature of the fixed finger of the chela of *G. bathus* is reminiscent of *Banareia*, and in fact there are strong superficial resemblances to *B. parvula* (Krauss, 1843), a very widespread Indo-West Pacific species that was long placed in the genus *Actaea*. GUINOT (1976) placed this species into *Banareia* with some reservations, but mainly because the shape of the male G1 is typical of *Banareia*, and the chelae are consistent with that genus. The G1 of *Gaillardiellus bathus* sp. nov. resembles those of *Gaillardiellus*, *Forestia*, and *Novactaea*, in being long, slender,



tapering towards a recurved tip, and with long setae subapically on the outer margin. The chelae of *Banareia* species have sharp cutting margins and the tips are pointed; in *Gaillardiellus* the margins are blunter and the fingers are more cusp-like.

*Forestia abrolhensis* (Montgomery, 1931), *Novactaea pulchella* (A. Milne Edwards, 1865) and *N. bella* Guinot, 1976, also look similar to *Gaillardiellus bathus* sp. nov., but they too can be separated using the differences in cheliped armature, male abdomen shape, and stronger carapace areolation. The sternal plate character that separates these three genera (see SERÈNE, 1984, figs 54, 55) is difficult to use with confidence, although NG & CLARK (1994) have found that larval characters appear to support the generic separation of at least *Novactaea* and *Gaillardiellus*.

**DISTRIBUTION.** — Only known from one sea-mount on the Norfolk Ridge, south of New Caledonia. Bathymetric range : 265-310 m.

### Genus *MERACTEA* Serène, 1984

#### *Meractaea multidentata* sp. nov.

Figs 2, 15e, 18a

**MATERIAL EXAMINED.** — **New Caledonia.** CHALCAL 2 : stn DW 69, 24°43.7'S, 168°07.9'E, 260 m, 27.10.1986 : 1 ♀ 19.3 x 12.6 mm (MNHN-B 22759). — Stn DW 79, 23°40.5'S, 168°00.1'E, 243 m, 30.10.1986 : 1 ♂ 25.6 x 17.0 mm (MNHN-B 22760); 1 ovig. ♀ 14.1 x 9.4 mm (MNHN-B 22768). — Stn DW 80, 23°26.7'S, 168°01.8'E, 160 m, 30.10.1986 : 1 ♂ 5.7 x 4.0 mm (MNHN-B 22769). — Stn DW 84, 23°23.8'S, 168°07.1'E, 170 m, 31.10.1986 : 1 ♂ 6.6 x 4.5 mm (MNHN-B 22770).

SMIB 4 : stn DW 43, 24°46.6'S, 168°08.8'E, 245 m, 08.03.1989 : 1 ♂ 8.8 x 5.8 mm (MNHN-B 22766). — Stn DW 53, 23°40.1'S, 167°59.9'E, 270 m, 09.03.1989 : 1 ♀ 20.1 x 14.0 mm (USNM Unreg.). — Stn DW 56, 23°20.6'S, 168°05.2'E, 260 m, 09.03.1989 : 1 ♂ 9.0 x 6.2 mm (MNHN-B 22763).

SMIB 5 : stn DW 70, 23°40.6'S, 168°01.1'E, 270 m, 07.09.1989 : 1 ♀ 14.5 x 9.6 mm, 1 damaged, sex undetermined 16.7 x 11.1 mm (MNHN-B 22762); 1 ♀ 13.0 x 8.9 mm (MNHN-B 22765). — Stn DW 71, 23°41.3'S, 168°00.7'E, 265 m, 07.09.1989 : ♀ 14.7 x 10.2 mm (MNHN-B 22761). — Stn DW 75, 23°40.9'S, 168°00.8'E, 270 m, 07.09.1989 : 1 ♂ 15.0 x 10.1 mm, 1 ♀ 14.7 x 10.1 mm (QM-W 20588). — Stn DW 77, 23°40.8'S, 168°01.1'E, 270 m, 07.09.1989 : 1 ♀ 18.8 x 12.6 mm (MNHN-B 22764). — Stn DW 79, 23°41.3'S, 168°01.1'E, 285 m, 7.09.1989 : 1 ♂ 20.3 x 13.6 mm (USNM Unreg.). — Stn DW 94, 22°19.6'S, 168°42.8'E, 275 m, 13.09.1989 : 1 ♂ 24.1 x 15.8 mm, 1 ♀ 16.3 x 10.7 mm (QM-W 20591).

SMIB 8 : stn DW 170, 23°40.5'S, 168°00.1'E, 243 m, 30.10.1986 : 1 ♀ 12.1 x 8.3 mm (MNHN-B 22767).

**TYPE SPECIMENS.** — The largest male (MNHN-B 22760) is the holotype; all other listed specimens are paratypes.

**DESCRIPTION.** — *Carapace.* Ovoid, *c.* 1.5 times broader than long (range 1.43-1.53); convex anteriorly, flat from side to side across postero-branchial regions. Regions all distinct and well separated by furrows, each region more-or-less sub-divided by large round tubercles of various sizes; 1F and 2F fused, rising abruptly from just behind frontal margin; 1M distinct; 2M longitudinally divided; 3M divided basally into three lobes, anterior lobe continuing as narrow anterior projection of 2-3 low blunt tubercles; 4M consisting of transverse row of 3 rounded tubercles, and fourth small one ventral to median tubercle; 1P divided longitudinally, with small rounded medial tubercles posteriorly; 2P with two strong transverse crests laterally projecting, the anterior one divided medially; postero-branchial regions with rounded tubercles. Anterolateral margins regularly convex; consisting of 4 evenly separated blunt teeth behind blunt exorbital tooth, each with two much smaller rounded tubercles in interspaces; minor tubercles placed on slightly ventral plane to main teeth, particularly anteriorly where first three minor tubercles form row in line with exorbital tooth but ventral to first major tooth; in smallest specimens (6-8 mm) minor tubercles almost non-existent. Front *c.* 0.3 times carapace width; frontal margin with narrow projecting medial and lateral lobes separated by broad convex margin; upper orbital border framed by 3-4 rounded lobes in



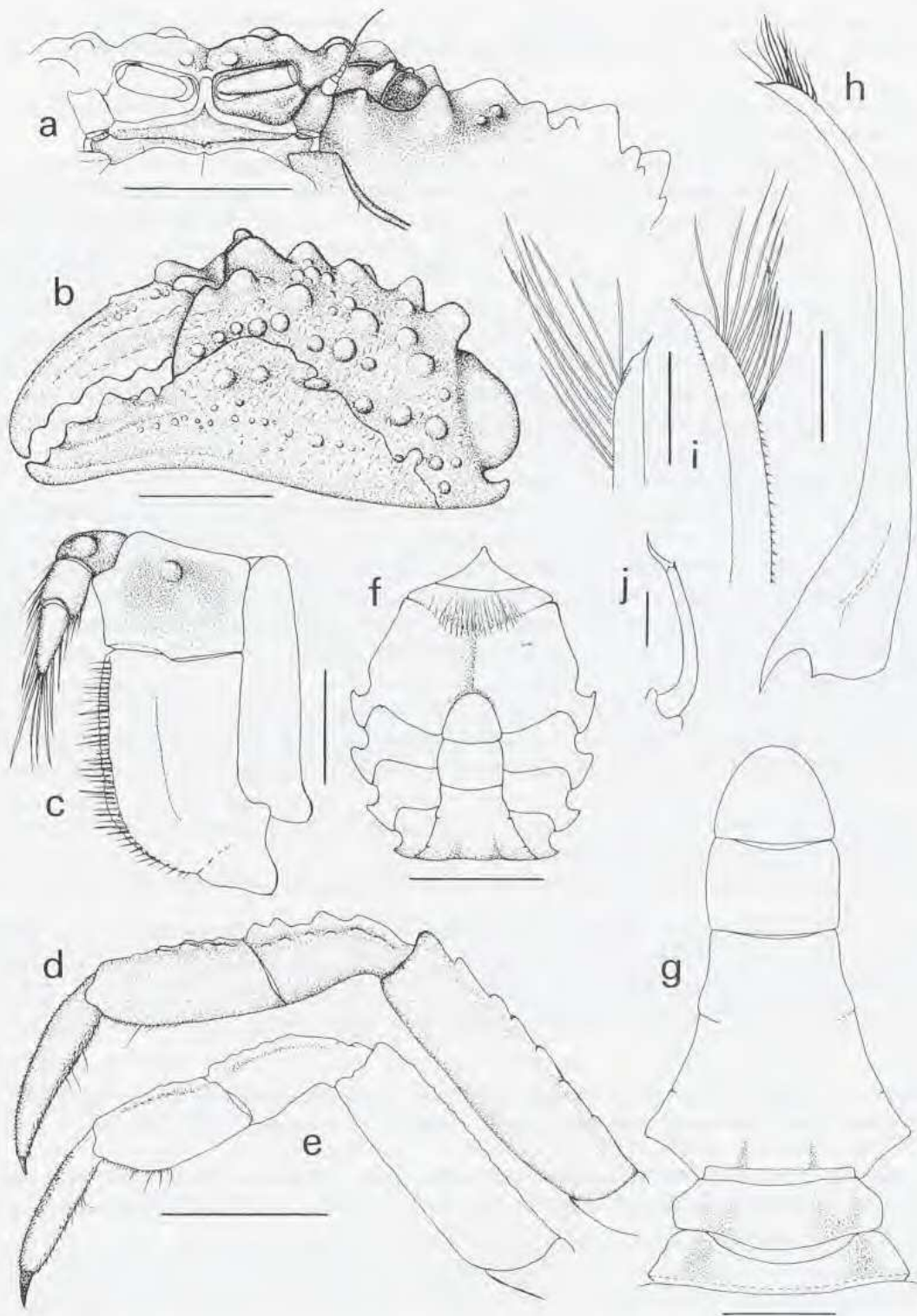


FIG. 2. — *Meractaea multidentata* sp. nov., a-e, h-j, holotype; f-g, paratype male : a, frontal view; b, left chela; c, third maxilliped; d, third walking leg; e, fourth walking leg; f, sternum; g, male abdomen; h-i, first gonopod and enlargement of tip; j, second male gonopod. Scale line a-b, d-f = 5 mm; c, g = 2 mm; h = 1 mm; i-j = 0.5 mm.

inner half; lower orbital border concave medially, with large rounded inner lobe. Antennal flagellum short. Basal antennal segment touching front; unarmed but swollen. Basal antennular segment with flagellum folding slightly obliquely.

*Third maxilliped.* Length of merus *c.* three-quarters width; single bulbous tubercle on outer face; *c.* 0.55 times length of ischium. Ischium rectangular, *c.* 1.5 times longer than wide.

*Chelipeds.* Subequal; robust, moderately large; palm height *c.* 0.5 times length of palm including fixed finger. Merus short and broad; with posterior border granulate, armed with small triangular subdistal tooth and rounded granular tubercle terminally. Carpus with inner angle produced as broad rounded tubercle; and broad, large triangular tooth ventral to it; upper surface of carpus covered with large rounded well-separated tubercles. Outer surface of palm coarsely granular, granules more-or-less forming 7 major rows; uppermost two rows formed by very large, swollen, rounded tubercles; ventral two rows continuing onto fixed finger as strong, more-or-less smooth ridges, reaching to tip. Outer surface of palm naked. Fingers dark-brown; colour not extending onto palm in most specimens, but in largest males colour of fixed finger rising up behind gape in broad arc and then extending obliquely backward almost to postero-ventral corner; inner surface of palm with colouring of fixed finger extending ventrally for most of length and extending dorsally to base of tubercles on superior margin as flat topped triangle leaving cream stripe behind gape. Ventral border of chela concave at base of fixed finger. Dorsal surface of dactylus with large bulbous tubercle basally. Fingers pointed; tips crossing.

*Walking legs.* Relatively long; flattened; slender; second pair slightly the longest. Merus of third leg *c.* 3.6 times longer than wide; carpus *c.* twice as long as wide; propodus *c.* 2.1 times longer than wide; dactylus longer than propodus. Dactyli straight; terminating in acute chitinous recurved tips. Meri superior margins armed with row of well-spaced, low, blunt, distally pointing tubercles, but unarmed terminally; lower margins unarmed. Carpi with accessory carinae on upper surface; upper margin bearing row of large blunt tubercles, continuing to a lesser extent onto propodi. Legs with scattered setae, and with fringe of very short setae on disto-ventral margins of propodi, and dorsal and ventral margins of dactyli.

*Abdomen.* Male relatively narrow; segments 3-5 fused. First segment broad, slightly narrower than third. Segments three-five tapering. Segment six *c.* 1.5 times wider than long. Telson subequal in length to sixth segment; *c.* 1.25 times wider than long; evenly rounded. Female abdomen also relatively narrow, not covering sternum.

*Gonopods.* G1 long, slender, curved; tip long, narrow, and acute; long setae present on disto-dorsal margin (see Fig. 2h-j). G2 short, evenly curved; tip short, recurved.

*Sternum.* Sternum relatively broad; telson reaching less than half length of fused sternites 3 and 4.

**COLOUR.** — Dorsal carapace and chelipeds predominantly orange/tan; the inter-regional furrows and the tops of the rounded elevations may become an off-white or pale pink especially towards the rear of the carapace. The merus of the last walking leg has one median and one distal band of the same colour as the carapace; and the carpus has a similar proximal band; on the other legs the median meral band is absent. Colour of chelipeds as already described.

**ETYMOLOGY.** — Named in reference to the more dentate appearance caused by the presence of accessory teeth between the normal four anterolateral teeth characteristic of the other two species in this genus.

**REMARKS.** — There are now three species included in *Meractaea*: *M. brucei* Serène, 1984, from East Africa; *M. tafai* Davie, 1993, from French Polynesia; and *M. multidentata* sp. nov. from New Caledonia.

*M. multidentata* can be easily separated from the other species by the extra, smaller, blunt accessory teeth on the anterolateral margin which gives it a "multi-dentate" appearance. The long abruptly narrowed apical beak on the male G1 is also a characteristic of the species; on the other two species the tip is broader and evenly tapering.

**HABITAT.** — Unrecorded.

**DISTRIBUTION.** — Found off New Caledonia, and south along the Norfolk Ridge. Bathymetric range : 160-285 m.



Genus *RATA* Davie, 1993*Rata chalcas* sp. nov.

Figs 3, 15b

MATERIAL EXAMINED. — New Caledonia. CHALCAL 2 : stn DW 84, 23°23.8'S, 168°07.1'E, 170 m, 31.10.1986 : 1 ♂ 7.0 x 5.2 mm (MNHN-B 22803).

TYPE SPECIMEN. — The unique male is the holotype.

DESCRIPTION. — *Carapace*. Transversely ovoid, *c.* 1.35 times broader than long. Fronto-orbital width *c.* 0.7 times carapace width. Carapace convex anteriorly, relatively flat from side to side across postero-branchial regions. Regions well defined, covered in rounded granules; separated by broad, unarmed, grooves; 1F and 2F not separated; 1M distinct, elongate; 2M distinct, longitudinally divided over anterior half, outer branch wider than inner branch; 3M entire; 4M more-or-less distinct; broad smooth groove posterior to raised orbital rim; 2L and 3L confluent; 4L, 5L and 6L all distinct; posterior and posterolateral regions not clearly defined. Anterolateral margins regularly convex; with three ill-defined granular lobes behind the exorbital angle; exorbital border not produced; carapace breadth slightly greatest between third anterolateral teeth; posterolateral margins convergent, straight, moderately cut-away dorsolaterally to receive meri of last pair of legs. Front *c.* 0.4 carapace width; moderately sinuous; not at all projecting; with pair of broad submedian lateral lobes and pair of lower, narrower, rounded, median lobes; lateral angles raised, rounded as part of orbital rim. Upper surface of carapace densely covered with short setae, longest in inter-regional furrows, shorter between the granules, which are thus conspicuous; definition of anterolateral teeth obscured by dense setae. Upper orbital border evenly granular; concave; median and lateral fissures fused, barely detectable. Lower orbital border relatively straight; evenly granular; inner angle without marked triangular tooth; without V-shaped notch laterally. Antennal flagellum entering orbit, fine, just reaching past outer edge of orbit; basal antennal segment touching front. Basal antennular segment moderately broad, flagellum folding almost transversely; anterolateral margins of epistome granular, lower margin sinuous, with deep lateral clefts.

*Third maxilliped*. Merus granular, *c.* 0.7 times wider than long; antero-external angle moderately produced, rounded; *c.* 0.6 times length of ischium. Ischium rectangular, length *c.* 1.4 times width, granular distally.

*Chelipeds* (Only right cheliped remains). Large and robust; palm height *c.* 0.55 times length including fixed finger. Merus with posterior border granulate, with acute subdistal and distal teeth. Carpus with inner angle strongly angular; connected by crest to small ventral tooth; upper and outer surfaces covered in rounded, well-separated tubercles. Outer surface of palm armed with coarse, well separated tubercles, more-or-less arranged in rows; densely covered by very short setae, from which the tubercles protrude. Inner surface of palm minutely granular. Immovable finger with ventral and median tuberculate ridges. Ventral border of chela slightly concave at base of fixed finger. Dorsal surface of dactylus coarsely tubercular proximally, becoming smaller distally; sub-dorsal longitudinal sulcus. Fingers pointed, tips crossing; without noticeable gape between cutting margins.

*Walking legs*. moderate length; compressed; relatively slender; first pair slightly the longest; slightly longer than carapace width. Merus of third leg *c.* 3.25 times longer than wide; carpus *c.* 2.3 times longer than wide; propodus *c.* 2.2 times longer than wide; dactylus *c.* 1.2 times length of propodus. Dactyli slender and straight; terminating in an acute, chitinous, recurved tip. Merus bearing small sharp granules along superior border; terminating in acute tooth; blunt granules along inferior border. Carpus with a longitudinal sulcus on upper surface bordered by two rows of sharp granules. Propodus also with two rows of smaller but relatively coarse sharp tubercles. All segments fringed with short, and longer, feathered, setae.

*Male abdomen*. Relatively narrow; third to fifth segments fused; first segment slightly the widest. Segments 3-5 tapering. Segment six moderately elongated, *c.* 1.1 times wider than long. Telson about as long as wide; triangular, rounded apically.

*Gonopods*. G1 long, slender, curved; long setae on dorsal margin near tip; small, conical setae along dorsal margin over distal third, and on ventral margin near tip; tip hollowed so that gonopore subterminal; bluntly pointed (see Fig. 3h-i). G2 short, evenly curved; tip short, reflexed, pointed.



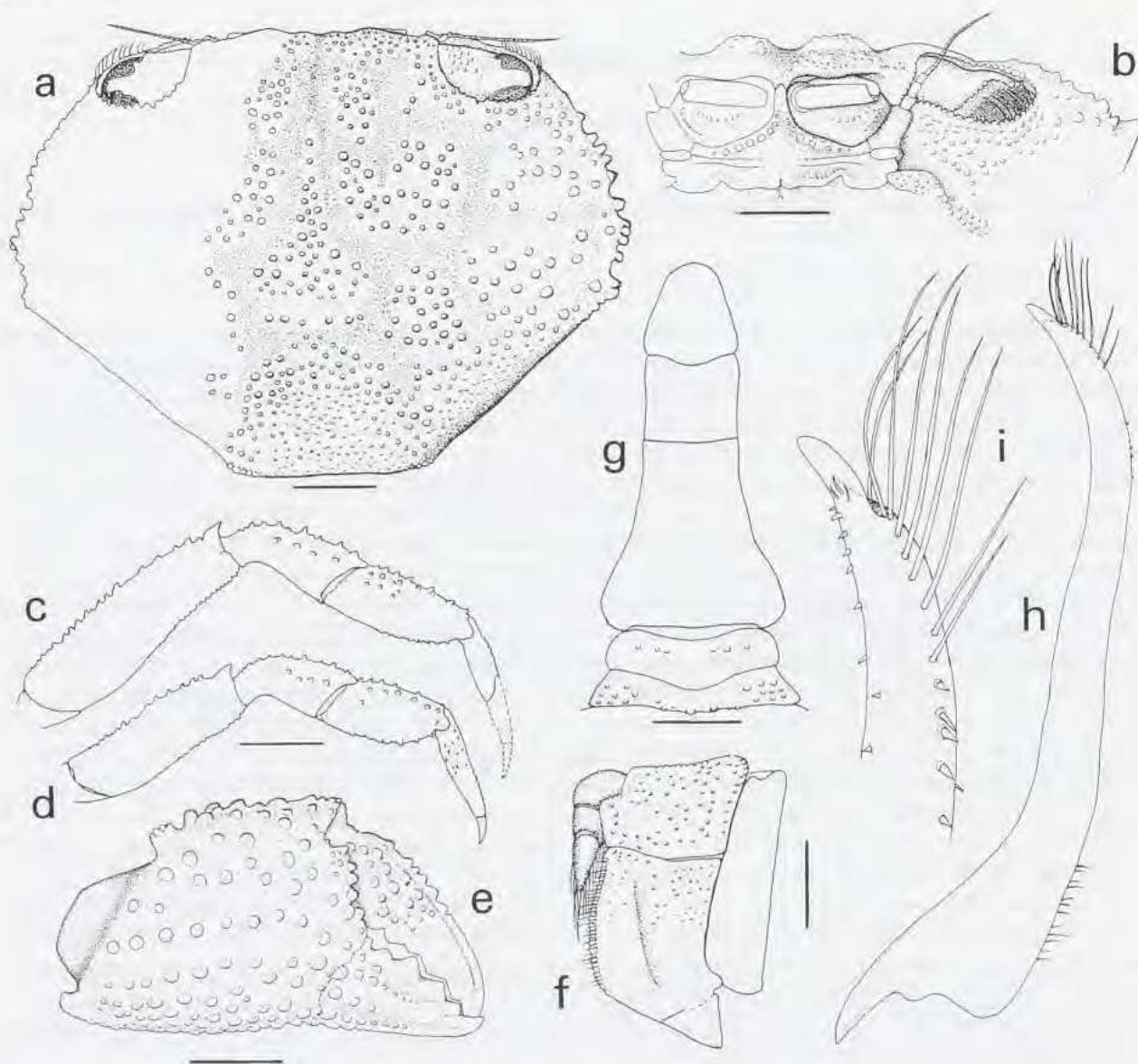


FIG. 3. — *Rata chalcal* sp. nov., holotype : a, dorsal carapace; b, frontal view; c, third walking leg; d, fourth walking leg; e, right chela; f, third maxilliped; g, male abdomen; h-i, first gonopod and enlargement of tip. Scale line a-e = 1mm; f-g = 0.5 mm.

ETYMOLOGY. — The name refers to the name of the cruise during which the holotype was collected; it is used as a noun in apposition.

REMARKS. — *Rata chalcal* sp. nov. differs from the only other member of the genus *R. tuamotense* Davie, 1993, by having the anterolateral teeth relatively poorly differentiated, and further obscured by dense, short setae; the dorsal carapace granulation is lower and less conspicuous; the lateral margins of segment 3 of the male abdomen are rounded, not angular; the antero-external angle of the third maxilliped is more broadly rounded; and the male G1 is slightly stouter.

DISTRIBUTION. — Only known from New Caledonia. Bathymetric range : 170 m.



## Subfamily ANTROCARCININAE Ng &amp; Chia, 1994

Genus *ANTROCARCINUS* Ng & Chia, 1994*Antrocarcinus petrosus* Ng & Chia, 1994

*Antrocarcinus petrosus* Ng & Chia, 1994 : 707-714, figs 1-4, 10A.

**MATERIAL EXAMINED.** — **New Caledonia.** CHALCAL 2 : stn DW 79, 23°40.5'S, 168°00.1'E, 243 m, 30.10.1986 : 1 ♂ carapace damaged (MNHN-B 22792).

SMIB 4 : stn DW 49, 24°45.5'S, 168°08.5'E, 300 m, 8.03.1989 : 1 ♂ 16.1 x 12.0 mm (MNHN-B 22791). — Stn DW 50, 23°42.2'S, 168°00.8'E, 295 m, 9.03.1989 : 1 ♀ 9.2 x 6.8 mm (MNHN-B 22790). — Stn DW 51, 23°41.3'S, 168°00.6'E, 260 m, 9.03.1989 : 1 ♀ 13.3 x 9.9 mm (USNM).

SMIB 5 : stn DW 75, 23°40.9'S, 168°00.8'E, 270 m, 7.09.1989 : 2 ♂ 10.2 x 7.7, 11.5 x 8.8 mm, 1 ♀ 8.6 x 6.6 mm (QM-W 20589). — Stn DW76, 23°41.2'S, 168°00.5'E, 280 m, 7.09.1989 : 1 ♂ 10.3 x 7.8 mm, 1 ovig. ♀ 11.0 x 8.4 mm (USNM). — Stn DW 92, 22°19.9'S, 168°41.3'E, 280 m, 13.09.1989 : 1 ♂ 13.6 x 10.1 mm (QM-W 20590). — Stn DW 96, 23°00.0'S, 168°18.7'E, 245 m, 14.09.1989 : 1 ♀ 8.6 x 6.7 mm (MNHN-B 22788).

**Loyalty Islands.** MUSORSTOM 6 : stn DW 423, 20°25.85'S, 166°40.5'E, 280 m, 16.02.1989 : 1 ♂ 12.4 x 9.1 mm (MNHN-B 22789).

**REMARKS.** — *Antrocarcinus petrosus* was described from New Caledonia from depths of 235-244 m. The present large series of specimens agree well with the description and figures of NG & CHIA (1994). The largest specimen, a male, measured 16.1 mm c.b. which is slightly larger than the largest specimen in the type series (a female of 13.6 mm). The known range is extended slightly southwards and eastwards, and the depth range is increased.

**DISTRIBUTION.** — New Caledonia, Loyalty Islands, and the Norfolk Ridge. Bathymetric range : 235-300 m.

## Subfamily EUXANTHINAE Alcock, 1898

Genus *ALAINODEUS* Davie, 1993

*Alainodaeus* Davie, 1993 : 515.

**TYPE SPECIES.** — *Alainodaeus akiaki* Davie, 1993, by original designation.

**REMARKS.** — DAVIE (1993) placed *Alainodaeus* closest to *Monodaeus* Guinot, 1967, and *Medaeops* Guinot, 1967. The male first gonopods of *Alainodaeus* are relatively unusual in form, although there is considerable variation in form amongst the euxanthine genera. The discovery of the two new species described in this paper has shown a significant degree of variation in the G1 within *Alainodaeus*, and it seems that it is possible that affinities outside the Euxanthinae as it is presently defined may be possible. *Alainodaeus nuku* sp. nov. looks very much like species now placed into *Nanocassiope* Guinot, 1967; and this suggests the two genera may be close. *Nanocassiope* however has a very characteristic male G1 that has the tip strongly recurved, and several strong, reflexed bristles subapically. Similarly the overall appearance and carapace shape are strongly reminiscent of panopeid genera such as *Micropanope* Stimpson, 1871, *Gonopanope* Guinot, 1967, and *Coralliope* Guinot, 1967, however this family has been precluded from containing possible relatives of *Alainodaeus* because its members typically have a characteristic male G1 with a highly flanged and twisted apex. *Micropanope* however has a relatively simpler G1, not so unlike that of *Alainodaeus*. More comparative work is needed to clarify the systematic position of *Alainodaeus*.



### Key to the species of *Alainodaeus*

1. First anterolateral tooth clearly marked; inner face of palm of cheliped with a median and ventral row of spinules ..... *A. akiaki* Davie, 1993
- First anterolateral tooth almost obsolete, represented at most by a few raised granules; inner face of palm of cheliped without a median and ventral row of spinules ..... 2
2. Outer face of palm of major cheliped entirely granular, although granules larger dorsally; suture between abdominal segments 3 and 4 strongly marked across entire width; male G1 with extremely produced medial flange on inner face, tip fluted ..... *A. alis* sp. nov.
- Outer face of palm of major cheliped only granular dorsally, becoming smooth over ventral half; suture between abdominal segments 3 and 4 not strongly marked; male G1 with moderate medial flange on inner face, tip with slender tongue ..... 3
3. Palm of major cheliped without a row of spines on the inner superior margin, at most only granules; inner angle of the carpus with only a single broad tooth ..... *A. nuku* sp. nov.
- Palm of major cheliped armed with a row of spines on the inner superior margin; inner angle of the carpus with a spinous tooth, and also a conspicuous ventral spine ..... *A. rimatara* Davie, 1993

### *Alainodaeus alis* sp. nov.

Fig. 4

**MATERIAL EXAMINED.** — **New Caledonia**, CHALCAL 2 : stn DW 73, 24°39.9'S, 168°38.1'E, 573 m, 29.10.1986 : 1 ♂ 8.1 x 5.9 mm (MNHN-B 22809).

**Wallis Island**, MUSORSTOM 7 : stn DW 582, 13°10'S, 176°14'W, dredged, 360 m, 22.05.1992 : 1 ♂ 5.7 x 4.3 mm, 1 ♀ 7.8 x 5.5 mm (MNHN-B 22810).

**TYPE SPECIMENS.** — The largest ♂ (MNHN-B 22809) is the holotype, the other specimens are paratypes.

**DESCRIPTION.** — *Carapace*. Transversely ovoid, *c.* 1.33-1.42 (1.37 in holotype) times broader than long; granular over most of surface, coarser and sharper anteriorly; without conspicuous setae; convex anteriorly, slightly convex from side to side across postero-branchial regions. Regions clearly indicated, separated by smooth grooves; 1F separated from 2F by granular transverse ridge; 1M marked anteriorly by oblique row of coarse granules; 2M broad, more-or-less entire; 3M clearly defined; 4M more-or-less separated; lateral branchial regions indistinct; 1P and 2P clearly separated laterally. Anterolateral border of carapace divided into four granular teeth or lobes; exorbital angle not produced; first tooth merely indicated by a few raised granules; second tooth with long posterior margin; third tooth slightly more prominent, more evenly triangular; fourth tooth much smaller than third, placed just behind third on posterolateral margin. Greatest carapace width across third teeth. Posterolateral borders markedly convergent, straight or slightly convex, longer than anterolateral. Posterior border costate. Front divided into two broad convex lobes by distinct V-shaped median notch; laterally clearly separated from supra-orbital angles. Supra-orbital border granular; median and lateral fissures obvious, with posterior grooves. Infra-orbital border minutely granular, with broad, relatively low, triangular tooth at inner end, just visible dorsally; narrow V-shaped notch below exorbital angle. Eystalk coarsely granular, tallest granules distally. Basal antennal segment relatively long, in contact with ventral prolongation of front; flagellum fine, reaching to about level of first anterolateral tooth. Basal segment of antennule with ridges on superior and lateral margins, flagellum folding nearly transversely.

*Third maxilliped*. Merus *c.* 0.5 times length of ischium, wider than long, anteroexternal angle slightly produced, rounded, surface granular; ischium *c.* 1.4 times longer than wide.

*Chelipeds*. Noticeably unequal, right largest and stoutest. Merus of right cheliped granular on outer face, upper border with row of prominent, well-spaced, spinous granules, without subterminal or terminal teeth. Carpus



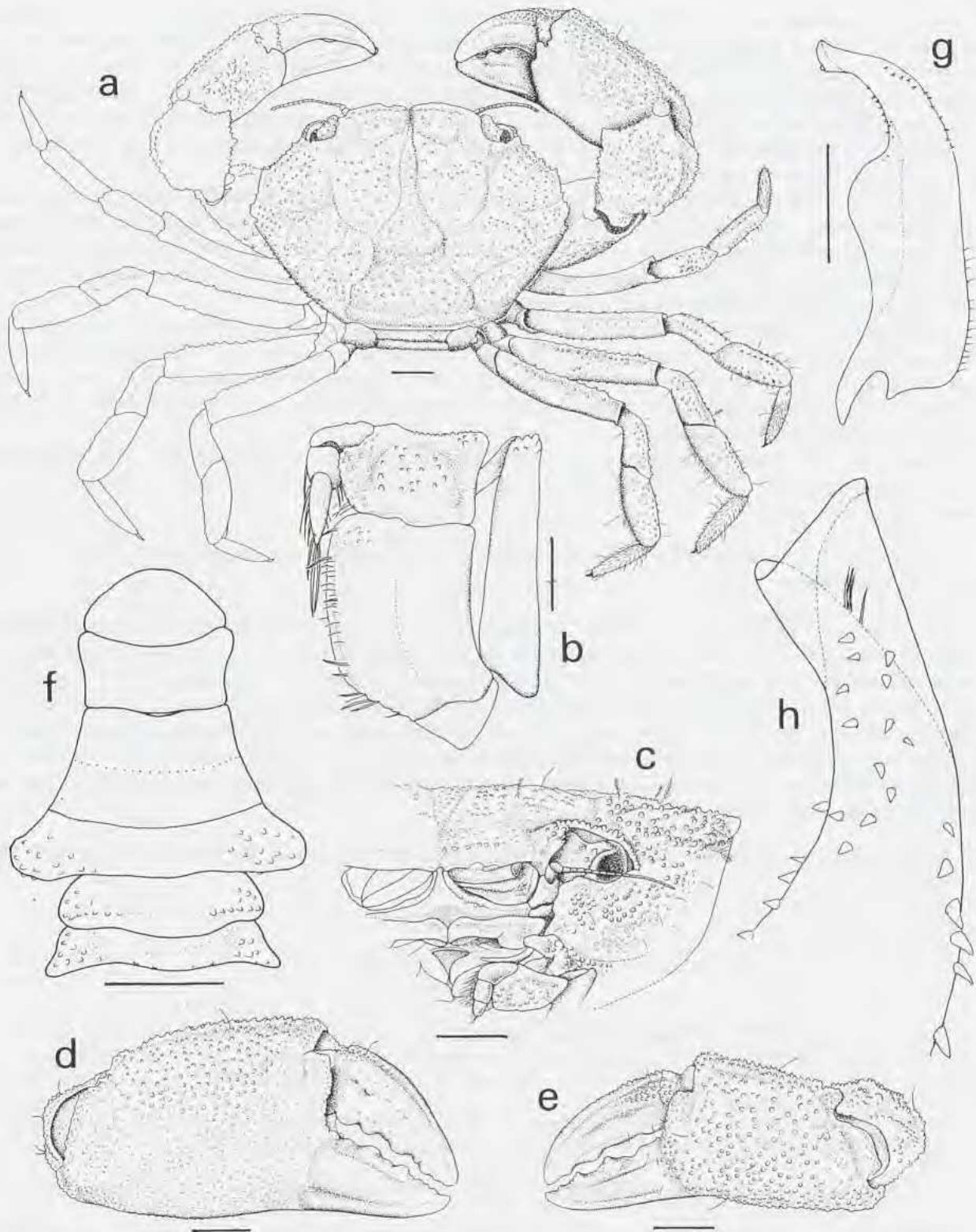


FIG. 4. — *Alainodaeus alis* sp. nov., holotype : a, dorsal view; b, third maxilliped; c, frontal view; d, right chela; e, left chela; f, abdomen; g-h, first gonopod and enlargement of tip. Scale line a, c-f = 1 mm; b, g = 0.5 mm.



coarsely granular, bearing strong triangular tooth at inner angle. Palm high, height *c.* 0.5 times length (including fixed finger); coarsely granulated dorsally, reducing in size ventrally; median longitudinal groove on upper margin separating 2 more-or-less well defined ridges; inner face smooth or with small granules but not conspicuously armed; immovable finger relatively long, ventral sub-marginal groove. Dactylus with broad, rounded, longitudinal ridge on superior margin, conspicuous over most of length. Cutting margins with 5-6 teeth, cristate distally, becoming more molariform proximally; tips bluntly pointed. Left cheliped of same form but fingers thinner and cutting margins sharper. Fingers of both chelae black or tan coloured.

*Walking legs.* Medium length, first three pairs subequal, *c.* 1.3 times carapace width. Margins of meri, carpi, and propodi sharply, and distinctly granulated. Third leg of holotype : merus *c.* 4.9 times longer than wide; carpus *c.* 2.4 times longer than wide; propodus *c.* 2.7 times longer than wide; dactylus *c.* 1.1 times longer than propodus.

*Sternum.* Punctate, minutely granular; groove separating fused sternites 3/4 strongly incised laterally, becoming smooth shallow groove medially; long longitudinal fissure on sternite 4.

*Male abdomen.* Segments 4-7 smooth, 1-3 minutely granular; segments 3-5 fused but suture between segments 3/4 clearly marked across entire width although there is no movement in the joint, suture between segments 4/5 less obvious; telson broadly rounded, *c.* 1.85 times wider than long, moderately sunken into segment 6; sixth segment with lateral margins slightly concave, slightly convergent posteriorly, *c.* 2 times wider than long; third segment the widest, laterally rounded.

*Gonopods.* G1 medium length, stout, inner margin with strongly produced, broad, flange over proximal two-thirds, sharply tapering distally, tip broadly fluted; small conical bristles on distal half (see Fig. 4g-h). G2 evenly curved; tip short recurved.

ETYMOLOGY. — Named after the ORSTOM research vessel *Alis* used on the MUSORSTOM 7 cruise; it is used as a noun in apposition.

REMARKS. — This species is placed into *Alainodaeus* with slight reserve. The suture between abdominal segments 3 and 4 is very distinct, to the extent that the joint appears not to be fused at all, although the two segments could not be moved independently. In the other species in the genus, *A. akiaki* Davie, 1993, *A. rimatara* Davie, 1993, and *A. nuku* sp. nov., the suture line is clearly evident laterally but there is no doubt that the segments are fused. The male G1 differs from the other species by having an extremely produced lateral flange on the inner margin, and also by having the tip broadly fluted; the large flange is just an extreme form of the moderate flanging present in the other species, but the apical fluting is distinctly different from the narrow apical tongue that characterises the other species.

DISTRIBUTION. — From New Caledonia, and Wallis Is., South-Western Pacific. Bathymetric range : 360-573 m.

*Alainodaeus nuku* sp. nov.

Fig. 5

MATERIAL EXAMINED. — **French Polynesia.** SMSRB (J. POUPIN) : *Marquesas Islands* : Nuku Hiva, stn D 83, 8°47.60'S, 140°05.00'W, dredged, 140 m, 25.01.1991 : 1 ♂ 8.9 x 6.1 mm (MNHN-B 22778); 1 ♂ 5.2 x 3.7 mm, 3 ♀ 5.2 x 3.7, 8.5 x 5.8, 9.9 x 6.5 mm (MNHN-B 22779). — *Eiao*, stn D 78, 7°57.45'S, 139°31.45'W, dredged, 100 m, 21.01.1991 : 1 ♂ 7.5 x 5.2 mm (QM-W 20583).

*Austral Islands* : Raevavae, stn D 66, 23°50.54'S, 147°42.73'W, dredged, 400 m, 03.12.1990 : 1 ♂ 6.9 x 4.9 mm, 1 ♀ 6.7 x 4.7 mm (USNM); 1 ♂ 5.2 x 3.8 mm, 2 ♀ 5.3 x 3.9, 5.6 x 4.1 mm (MNHN-B 22780).

TYPE SPECIMENS. — The largest ♂ (MNHN-B 22778) is the holotype, all other specimens are paratypes.

DESCRIPTION. — *Carapace.* Transversely ovoid, *c.* 1.36-1.52 times broader than long, tendency to broaden with increasing size; granular over most of surface, less conspicuous on mesogastric and cardiac regions; without setae; convex anteriorly, slightly convex from side to side across postero-branchial regions. Regions clearly indicated, separated by smooth grooves; 1F and 2F confluent swollen, coarsely granular; 1M marked anteriorly by row of



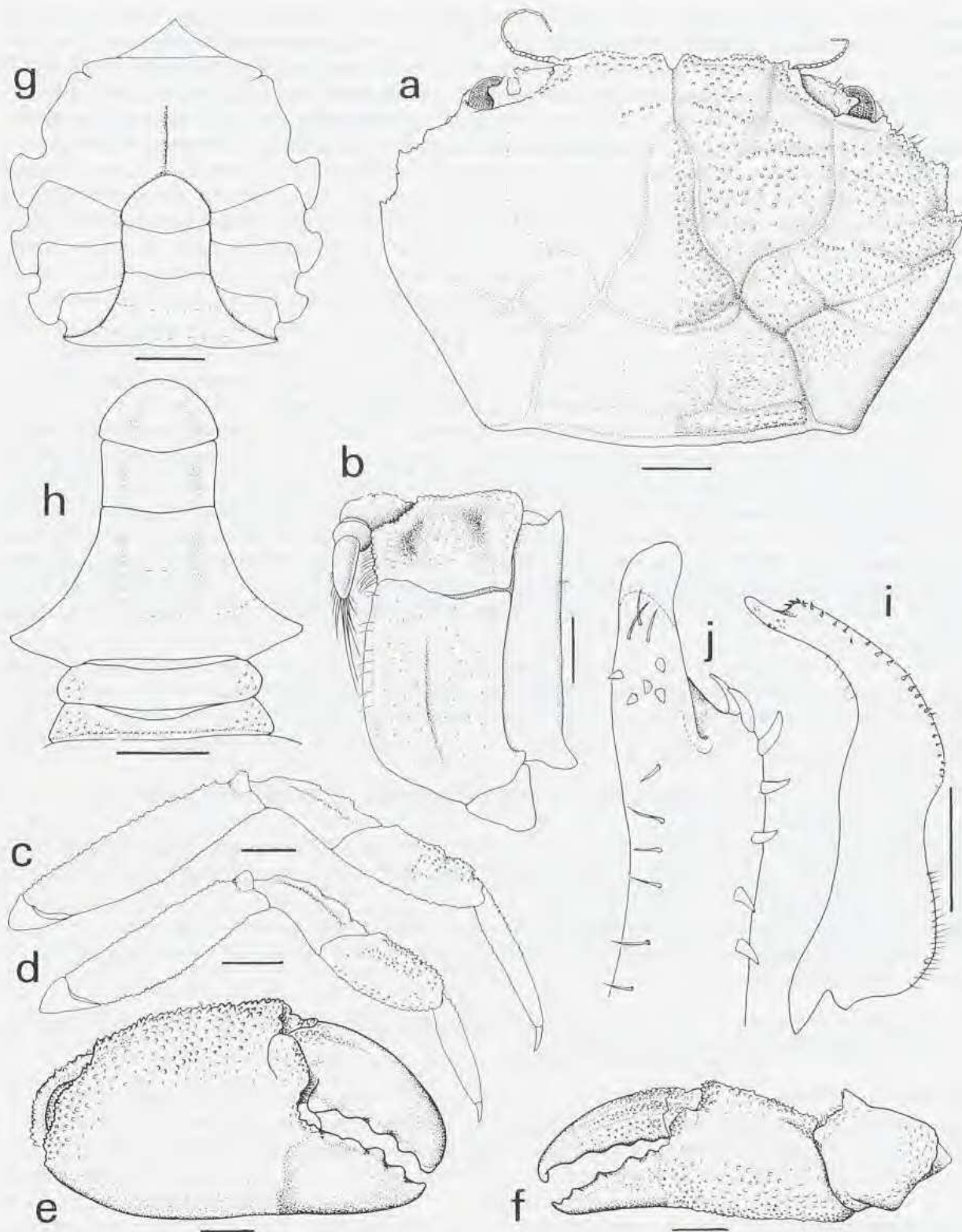


FIG. 5. — *Alainodaeus nuku* sp. nov., holotype : a, dorsal carapace; b, third maxilliped; c, third walking leg; d, fourth walking leg; e, right chela; f, left chela; g, sternum; h, abdomen; i-j, first gonopod and enlargement of tip. Scale line a, c-h = 1 mm; b, i = 0.5 mm.



coarse granules; 2M broad, outer half with anterior raised granular row; 3M clearly defined; 4M more-or-less separated; 1L not defined; 2L and 3L confluent; 4L distinct; 5L with raised granular row anteriorly, confluent with 6L anteriorly, separated by narrow groove over posterior half; 1R, 2R confluent, separated from 3R; 1P and 2P clearly separated. Anterolateral border of carapace divided into four granular teeth or lobes; exorbital angle not produced; first tooth merely indicated by a few raised granules, clearly separated from exorbital angle; second and third subequal, triangular, tipped with sharp granule; fourth tooth very small, just behind third on posterolateral margin. Greatest carapace width across third teeth. Posterolateral border markedly convergent, straight or slightly sinuous, longer than anterolateral. Posterior border costate. Front not produced, divided into two sinuous lobes by U-shaped median notch, with distinct median projections lateral to notch; laterally clearly separated from supra-orbital angles. Supra-orbital border granular; median and lateral fissures obvious, with posterior grooves. Infra-orbital border granular, with broad, relatively low, triangular tooth at inner end, just visible dorsally; narrow v-shaped notch below exorbital angle. Eyestalk coarsely granular, tallest granules distally. Basal antennal segment minutely granular, in contact with ventral prolongation of front; flagellum slightly longer than width of orbit. Basal segment of antennule with strong ridges on superior and lateral margins, flagellum folding transversely.

*Third maxilliped.* Merus *c.* 0.5 times length of ischium, wider than long, anteroexternal angle slightly produced, rounded, surface minutely granular; ischium *c.* 1.3 times longer than wide.

*Chelipeds.* Noticeably unequal, right largest and stoutest. Merus of right cheliped granular on outer face, upper border coarsely granular, without subterminal or terminal teeth. Carpus coarsely granular, bearing strong triangular tooth at inner angle, and very small poorly defined tooth ventral to it. Palm high, height *c.* 0.5 times length (including fixed finger); coarsely granulated dorsally becoming smooth ventrally; broad median longitudinal groove on upper margin; second broad groove on outer face proximo-dorsally, widening towards carpal joint; immoveable finger relatively long, ventral sub-marginal groove. Dactylus with longitudinal ridge on superior margin, only conspicuous proximally; cutting margin with larger, blunt, backwardly projecting molar basally. Left cheliped of same form but fingers thinner and cutting margins sharper; dactylus lacking basal molar. Fingers of both chelae usually tan coloured.

*Walking legs.* Medium length, first three pairs subequal, *c.* 1.3 times carapace width. Margins of meri, carpi, and propodi sharply, and distinctly granulated; anterior margins of carpi and propodi each with two more-or-less distinct granular lobes, absent on some smaller specimens. Third leg of holotype: merus *c.* 3.8 times longer than wide; carpus *c.* 2.5 times longer than wide; propodus *c.* 2.2 times longer than wide; dactylus *c.* 1.3 times longer than propodus.

*Sternum.* Granular; groove separating fused sternites 3/4 strongly incised laterally, but not obvious medially; long longitudinal fissure on sternite 4.

*Male abdomen.* Smooth; segment 3-5 fused; telson broadly rounded, *c.* 1.6 times wider than long, moderately sunken into segment 6; sixth segment with lateral margins subparallel, *c.* 2 times wider than long; third segment the widest, laterally triangular.

*Gonopods.* G1 medium length, stout, moderately broadly flanged over proximal two-thirds, sharply tapering to bluntly rounded apical tongue, slightly twisted tip; with short, stout setae dorso-distally, becoming small conical bristles on distal half (see Fig. 5i-j).

ETYMOLOGY. — Named in reference to the type locality, but using only the first word of the Polynesian name, "Nuku Hiva". It is used as a noun in apposition.

REMARKS. — This is the fourth species to be described in *Alainodaeus*. *A. nuku* sp. nov. differs from *A. alis* sp. nov. by the characters already remarked under that species. It differs from the two previously described species, *A. akiaki* Davie, 1993, and *A. rimatara* Davie, 1993, in the following characteristics.

1. *A. nuku* is apparently a much smaller species, with all the present specimens less than 10 mm carapace breadth; *A. akiaki* reaches *c.* 37 mm; and *A. rimatara* reaches *c.* 23 mm. It is possible that larger specimens of *A. nuku* might be caught in traps although this has so far not been the case. The largest male (the holotype) seems to have the right chela very robust and swollen which would seem characteristic of a fully mature crab.

2. *A. nuku* is most similar to *A. rimatara* in the armature of the major cheliped. Like that species the chela has granulation only over the outer dorsal surface, which becomes smooth ventrally. Unlike *A. rimatara* and *A. akiaki*



the inner face is unarmed and there is no row of spines on the inner superior margin, merely a row of granules. Secondly, the inner angle of the carpus has only a single, less spinous, broad tooth, whereas the other two species both have a conspicuous ventral spine below it.

3. *A. nuku* has two characteristic small, granular lobes on the anterior margins of the carpi and propodi of the walking legs, which the other species lack.

4. Like *A. rimatara* it has a very poorly defined first anterolateral tooth, often only indicated by a prominent granule.

DISTRIBUTION. — Only known from the Marquises and Austral Islands, French Polynesia.

*Alainodaeus rimatara* Davie, 1993

*Alainodaeus rimatara* Davie, 1993 : 519-522, fig. 6, pl. 6.

MATERIAL EXAMINED. — **New Caledonia**, CHALCAL 2 : stn CH 3, 24°47.88'S, 168°09.32'E, 257 m, 27.10.1986 : 1 ♂ 7.7, 1 ♀ 8.0 mm (MNHN-B 22905). — Stn DW 69, 24°43.7'S, 168°07.9'E, 260 m, 27.10.1986 : 1 ♂ 8.9 mm (MNHN-B 22906). — Stn DW 71, 24°42.26'S, 168°09.52'E, 230 m, 27.10.1986 : 5 ♂ 6.0-7.1 mm (MNHN-B 22907).

MUSORSTOM 4 : stn CP 172, 19° 16.0'E, 275-330 m, 17.09.1985 : 1 ♂ 11.6 mm (MNHN-B 22908).

SMIB 4 : stn DW 43, 24°46.6'S, 168°08.8'E, 245 m, 8.03.1989 : 1 ♂ 11.0 mm (MNHN-B 22909). — Stn DW 45, 24°46.0'S, 168°08.7'E, 260 m, 8.03.1989 : 1 ♂ 11.6 mm (MNHN-B 22910). — Stn DW 53, 23°40.1'S, 167°59.9'E, 270 m, 9.03.1989 : 1 ♂ 8.4 mm (MNHN-B 22911).

SMIB 5 : stn DW 70, 23°40.6'S, 168°01.1'E, 270 m, 7.09.1989 : 1 ♂ 9.1 mm (MNHN-B 22912). — Stn DW 71, 23°41.3'S, 168°00.7'E, 265 m, 7.09.1989 : 1 ♂ 6.1 mm (MNHN-B 22913). — Stn DW 73, 23°41.4'S, 168°00.6'E, 240 m, 7.09.1989 : 1 ♂ 10.4 mm (MNHN-B 22914). — Stn DW 74, 23°40.2'S, 168°00.9'E, 245 m, 7.09.1989 : 1 ovig. ♀ 10.3 mm (MNHN-B 22915). — Stn DW 75, 23°40.9'S, 168°00.8'E, 270 m, 7.09.1989 : 1 ♀ 10.4 mm (MNHN-B 22916). — Stn DW 78, 23°40.8'S, 168°00.2'E, 245 m, 7.09.1989 : 1 ♂ 6.8 mm (MNHN-B 22917). — Stn DW 90, 22°19.1'S, 168°41.6'E, 340 m, 13.09.1989 : 1 ♂ 11.1 mm (MNHN-B 22918).

BERYX 2 : stn CP 44, 23°41'S, 168°01'E, 230-250 m, 20.10.1992 : 1 ♂ 10.0 mm (MNHN-B 22919).

SMIB 8 : stn CP 161, 24°46.7'S, 168°09'E, 232-251 m, 28.01.1993 : 1 ♀ 9.5 mm [colour transparency available] (MNHN-B 22920).

BATHUS 3 : stn CH 801, 23°39'S, 168°00'E, 270-300 m, 27.11.1993 : 1 ♀ 12.7 mm [colour transparency available] (MNHN-B 22921). — Stn CP 815, 23°47'S, 168°17'E, 460-470 m, 28.11.1993 : 1 ♂ 6.6 mm (MNHN-B 22922). — Stn DW836, 23°02'S, 166°59'E, 295-306 m, 30.11.1993 : 3 ♀ 6.1-6.7 mm (MNHN-B 22923).

**Loyalty Islands**. MUSORSTOM 6 : stn DW 399, 20°41.80'S, 167°00.20'E, 282 m, 14.02.1989 : 1 ♂ 13.4 mm [colour transparency available] (MNHN-B 22924); 3 ♂ 9.2-9.6 mm (MNHN-B 22935). — Stn DW 452, 21°00.30'S, 167°25.50'E, 300 m, 20.02.1989 : 1 ♂ 10.4 mm [colour transparency available] (MNHN-B 22925). — Stn DW 474, 21°08.8'S, 167°55.5'E, 260 m, 22.02.1989 : 2 ♂ 5.0, 5.5 mm, 1 ♀ 9.0 mm (MNHN-B 22926).

**Chesterfield Islands**. MUSORSTOM 5 : stn DW 255, 25°15.40'S, 159°54.80'E, 280-295 m, 7.10.1986 : 2 ♂ 10.6, 10.8 mm, 2 ♀ 4.9, 7.8 mm (MNHN-B 22927); 1 ♂ 6.7 mm [colour transparency available] (MNHN-B 22936). — Stn CP 278, 24°10.80'S, 159°38.10'E, 265 m, 10.10.1986 : 1 ♂ 7.4 mm (MNHN-B 22928). — Stn DW 299, 22°47.7'S, 159°23.7'E, 360-390 m, 11.10.1986 : 1 ♀ 10.3 mm (MNHN-B 22929). — Stn DW 304, 22°10.34'S, 159°25.51'E, 385-420 m, 12.10.1986 : 2 ♂ 7.3, 9.6 mm (MNHN-B 22930).

**SW Vanuatu**. VOLSMAR : stn DW 6, 22°27.2'S, 171°44.5'E, 480 m, 1.06.1989 : 1 ♂ 5.6 mm (MNHN-B 22931). — Stn DW 7, 22°26.0'S, 171°44.1'E, 400 m, 1.06.1989 : 3 ♂ 6.3-7.9 mm, 3 ♀ 6.0-11.9 mm (MNHN-B 22932). — Stn DW 16, 22°25.1'S, 171°40.7'E, 500 m, 3.06.1989 : 1 ♂ 7.7 mm (MNHN-B 22933). — Stn DW 50, 420 m, 4.07.1989 : 1 ♂ 8.3 mm (MNHN-B 22934).

COLOUR. — Dorsal surface of carapace pale orange with an even covering of small, dark-orange/brown spots. Chelipeds similar but without spotting. Walking legs with broad medial and distal dark-orange bands on the meri.

REMARKS. — The present series of specimens agree closely with the types. Most are smaller than the type series but this is attributed to the fact that the original specimens were caught by trap, and this technique would have been selective for only larger individuals. *Alainodaeus rimatara* is the most common deepwater xanthid represented in the collections from the New Caledonian region. Its congener *A. alis* sp. nov. also occurs in



New Caledonia but is apparently rare. These records mark a significant westwards range extension for this recently described species.

DISTRIBUTION. — Southwestern Pacific : from Tuamotu Archipelago (type locality), and the Austral Islands, French Polynesia; and now westwards to New Caledonia, Loyalty Islands and the Norfolk Ridge. Bathymetric range : 90-500 m.

Genus *PALATIGUM* nov.

TYPE SPECIES. — *Palatigum trichostoma* sp. nov., here designated.

ETYMOLOGY. — Formed from the Greek *palatum* meaning the roof of the mouth, followed by a neuter form of a suffix *gum*, formed from *magnus* meaning large. The name refers to the large, projecting lower border of the epistome, an important character in separating this genus from its nearest allies. Gender is neuter.

DIAGNOSIS. — Carapace transversely ovoid; regions well defined, 1M and 2M confluent, 2M completely divided longitudinally, 4M separated from 3M, 2P with transverse, laterally angular, crest; posterior margin costate. Anterolateral margins with four, pointed, primary teeth behind the exorbital angle, with or without ancillary teeth. Anterior to first tooth is oblique granular row continuing towards anterolateral corner of buccal frame; greatest carapace width across third teeth. Antennal flagellum small, entering orbit. Basal antennal touching front. Basal antennular segment with palp folding slightly obliquely. Lower margin of epistome strongly projecting as thin rim; lateral margins strongly receding from centre, before meeting very large, broad, triangular lateral teeth. Third maxilliped, including exopod, completely and thickly covered in "fur" of feathered setae. Chelipeds unequal, robust, right cheliped the larger; minor cheliped of similar form but more slender; base of cutting margin of dactylus of larger chela with large, blunt, backwardly projecting molar. Walking legs of medium length.

Female abdomen relatively narrow, not covering entire sternum. Sternum with suture between segments 3/4 deeply incised laterally, continuing as deep transverse groove across entire width.

REMARKS. — *Palatigum* gen. nov. belongs in the Euxanthinae Alcock (*sensu* SERÈNE, 1984) because the anterolateral margin does not simply meet the exorbital angle but continues below the orbit across the sub-hepatic region towards the buccal frame. The lack of sub-hepatic cavities, the relatively long posterolateral borders that are not strongly hollowed out to receive the walking legs, and the strong carapace areolation with 4M clearly demarcated, together place *Palatigum* closest to *Medaeus* Dana, 1851, and the Atlantic and eastern Pacific genus, *Edwardsium* Guinot, 1967. Indeed, superficially *Palatigum trichostoma* sp. nov. looks most like *Edwardsium lobipes* Rathbun, 1898, and *E. crosslandi* Finnegan, 1931, both described from the Galapagos. Table 1 gives the most conspicuous differences separating *Palatigum* from these two genera.

	<i>Medaeus</i> and <i>Edwardsium</i>	<i>Palatigum</i>
1. Lower border of epistome	not strongly projecting, sloping down	strongly projecting, directed forwards
2. 1M and 2M fused	No	Yes
3. 2M divided	indistinctly	strongly
4. Third maxilliped	without unusual setal covering	completely and thickly covered in "fur" of feathered setae
5. Strongly differentiated basal tooth on major chela	No	Yes

TABLE 1. — Differences between *Palatigum* gen. nov. and *Medaeus* and *Edwardsium*.



The lower border of the epistome is quite different from *Medaeus* and *Edwardsium* not only by projecting forward so strongly, but also by having the lateral lobes unusually wide, and separated from the medial margin by a broad deep V.

The setation of the third maxilliped is a most remarkable feature of the type species, *Palatigum trichostoma* sp. nov. It is particularly unusual because this crab otherwise has relatively few setae, apart from patches distally on the propodi, and on the dactli of the walking legs. I believe that because this character is so unusual in the family, that it is of generic significance, but this will need to be assessed in the light of future species that may be assigned to this genus.

The strongly differentiated basal tooth on the dactylus of the major chela is a common character in several other euxanthine genera such as *Alainodaeus* Davie, 1993, *Cranaothus* Ng, 1993, *Paramedaeus* Guinot, 1967, *Paraxanthodes* Guinot, 1967, *Medaeops* Guinot, 1967, *Miersiella* Guinot, 1967, and *Monodaeus* Guinot, 1967. This character has not been mentioned before as having potential phylogenetic importance, but NG (1993) noted its presence in both *Cranaothus deforgesi* Ng, 1993, and *Paramedaeus noelensis* (Ward, 1934), and suggested that, as in *Calappa*, it may be used to "peel" open gastropods.

*Palatigum trichostoma* sp. nov.

Figs 6, 16a-b, e, 18c

MATERIAL EXAMINED. — **New Caledonia.** CHALCAL 2 : stn DW 79, 23°40.5'S, 168°00.1'E, 243 m, 30.10.1986 : 1 ♀ 13.8 x 9.8 mm (MNHN-B 22801).

SMIB 8 : stn DW 173, 23°40.5'S, 168°00.5'E, 234-242 m, 29.01.1993 : 1 ♀ 12.9 x 9.0 mm (MNHN-B 22802).

TYPE SPECIMENS. — The largest female (MNHN-B 22801) is the holotype, the other female a paratype.

DESCRIPTION. — *Carapace.* Transversely ovoid; *c.* 1.41-1.43 times broader than long. Carapace convex longitudinally over anterior third, more-or-less flat from side to side. Regions well defined, elevated, separated by strong furrows; 1F and 2F fused, slightly elevated; 1M and 2M confluent; 2M completely and deeply divided longitudinally; 3M slightly bilobed posteriorly; 4M elevated and separated from 3M; all anterolateral regions defined, 2L partially divided; posterolateral regions tubercular; 1P relatively distinct; 2P with transverse crest, strongly raised and angular laterally, barely distinguishable medially; posterior margin costate, with broad, minutely granular rim; posterolateral margins straight. Anterolateral margins regularly convex; with four, pointed, primary teeth behind the exorbital angle, rounded ancillary teeth on anterior and posterior slopes of second and third primary teeth; first tooth the smallest, well separated from orbit by broad granular lobe; anterior to first tooth is an irregular oblique granular row continuing on towards anterolateral corner of buccal frame; greatest carapace width across third teeth. Front *c.* 0.36 times carapace width; moderately projecting, minutely granular; narrow medial projections, and slightly broader, rounded submedian projections; laterally concave, with prominent blunt lateral projections; pre-orbital tooth bluntly pointed. Carapace surface tuberculate and granular except in smooth furrows separating regions; without setae. Upper orbital border concave, pair of shallow smooth furrows mark coalesced median and lateral fissures. Lower orbital border inner angle formed by triangular, minutely granular, bluntly pointed tooth; laterally with similar bluntly pointed, triangular tooth; with shallow V-shaped notch laterally; deep transverse sulcus below lower orbital teeth. Antennal flagellum small and entering orbit, fine, reaching to about end of cornea. Basal antennal touching front. Basal antennular segment with slightly raised rim across upper and lateral margins, palp folding slightly obliquely. Lower margin of epistome strongly projecting as thin rim; lateral margins strongly receding from centre, before meeting very large, broad, triangular lateral teeth.

*Third maxilliped.* Merus width *c.* 0.8 times length; antero-external angle slightly produced; *c.* 0.5 times length of ischium. Ischium tapering towards base, *c.* 1.5 times longer than wide. Third maxilliped, including exopod completely and thickly covered in "fur" of feathered setae.

*Chelipeds.* Unequal; robust, right cheliped the larger; minor cheliped of similar form but more slender. Merus with posterior border cristate, granular; granular subdistal tooth, and flat, triangular, distal tooth. Carpus with broad, triangular tooth at inner angle, and small blunt tooth ventral to it; upper and outer surfaces coarsely rugose



and granular. Outer surface of palm without setae; armed with 7 rows of tubercles; first row on inner dorsal margin in form of 4 large, slightly curved, triangular spines; dorsal-most rows with largest tubercles, size decreasing ventrally. Immobile finger of major chela with strong ventral and median ridges. Ventral border of chela slightly concave at base of fixed finger. Dorsal surface of dactylus with strong, blunt, median crest, bearing strong triangular tooth at base; two smaller lateral teeth one on inner, and one on outer surface, at bases of sub-median longitudinal crests. Fingers pointed, moderately recurved, tips crossing; base of cutting margin of dactylus of larger chela with large, blunt, backwardly projecting molar; fixed finger with row of five blunt molariform teeth, decreasing in size distally, basal tooth in form of broad plate opposing basal tooth of dactyl. Left cheliped of same form but fingers thinner and cutting margins sharper; dactylus lacking basal molar. Fingers of both chelae dark-brown to tan coloured.

*Walking legs.* Medium length, first pair slightly the longest, about equal to carapace width. Anterior margins of meri and carpi with lobulate crests, lobules largest on carpi taking form of 3-4 strong, triangular, bluntly pointed teeth. Third leg of paratype : merus *c.* 3.25 times longer than wide; carpus *c.* 1.8 times longer than wide; propodus *c.* 2.0 times longer than wide; dactylus *c.* 1.25 times longer than propodus. Few setae except for short "fur", interspersed with longer setae, entirely covering dactyli, and most of propodi except for bare area proximally.

*Female abdomen and sternum.* Abdomen relatively narrow, not covering entire sternum. Sternum minutely granular; suture between segments 3/4 deeply incised laterally, continuing as deep transverse groove across entire width; patch of long setae obscuring middle of transverse groove, otherwise sternum without conspicuous setation.

*COLOUR.* — Dorsal surface of carapace and chelipeds predominantly pinkish-mauve, overlaid with orange especially on the claws and over the posterior half of the carapace. Fingers of chelipeds black, colour not extending onto palm in the female types. Walking legs bluish-white with a small patch of orange subdistally on anterior margin of merus and on upper face of carpus.

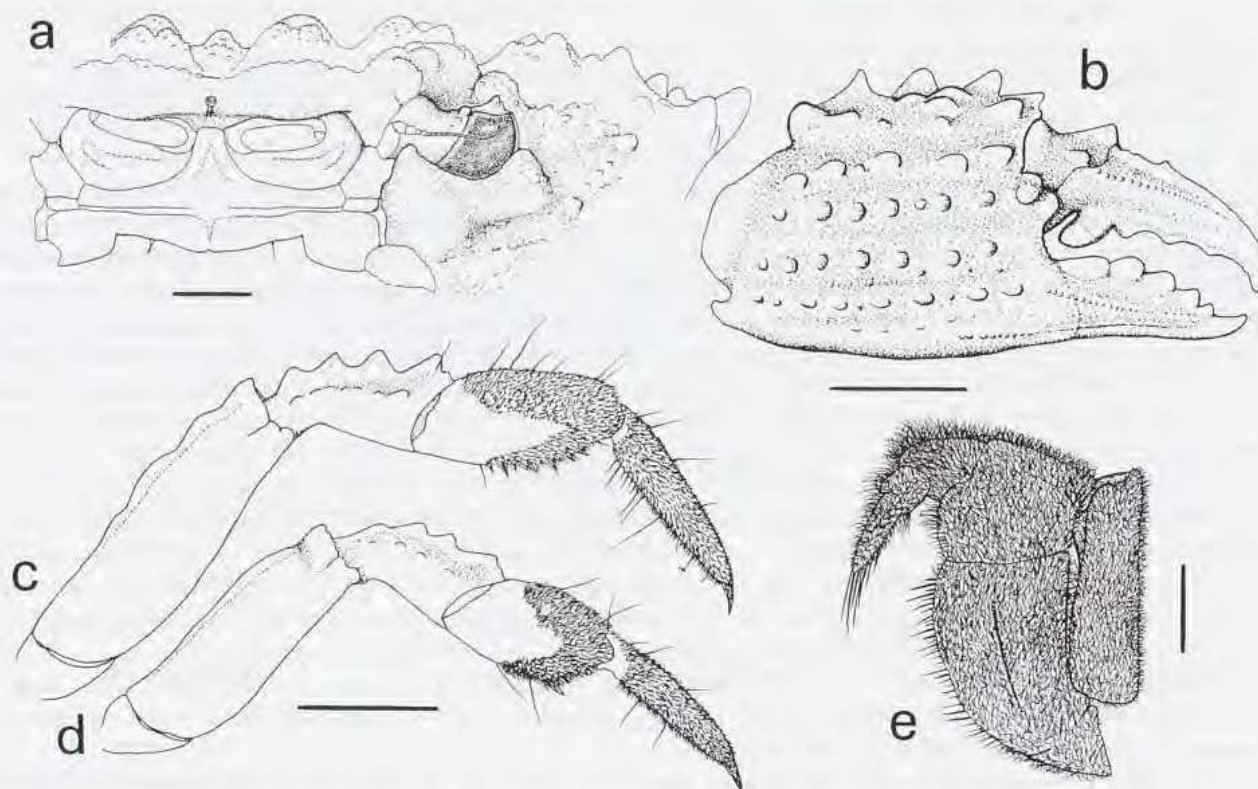


FIG. 6. — *Palatigum trichostoma* gen. nov., sp. nov., paratype female : a, frontal view; b, right chela; c, third walking leg; d, fourth walking leg; e, third maxilliped. Scale line a, e = 1mm; b-d = 2mm.



ETYMOLOGY. — From the Greek *trichos* (hair) and *stoma* (mouth). Named in reference to the extremely setose third maxillipeds.

REMARKS. — The thickly "furred" third maxillipeds are a singular feature of this new species; and a very unusual character for an otherwise little setose crab. The broader relationships have already been discussed under the generic remarks.

DISTRIBUTION. — Only known from the West Joumeau Bank, New Caledonia. Bathymetric range : 234-243 m.

#### Genus *MEDAEOPS* Guinot, 1967

*Medaeops* Guinot, 1967a : 366; 1971 : 1073. — SERÈNE, 1984 : 91.

REMARKS. — I find the characteristics which separate the genera *Medaeops* Guinot, 1967, and *Monodaeus* Guinot, 1967, to be not very clear. GUINOT (1967) relied on a number of characters in combination to split the two genera, and she did so only after careful deliberation. I believe however that with the description of recent species in *Monodaeus* (see GUINOT & MACPHERSON, 1988), and *Medaeops* (present work), new characters must be found in order to diagnose these two genera unequivocally. This will require a careful re-examination of all the species, and this is beyond the scope of the present work.

I have not placed the two new species described here into the genus *Monodaeus* because : 1) the meri of the walking legs are relatively shorter than those of most of the *Monodaeus* species (*Monodaeus tuberculidens* Rathbun, 1911, is very close in this respect); and 2) the fingers of the chelipeds are relatively short and sturdy, and not long, narrow, and incurved, which seems a constant feature of *Monodaeus* species.

The third maxillipeds of the new species have the anteroexternal angles produced, and while this has been considered a characteristic of *Monodaeus*, it seems variable (see GUINOT & MACPHERSON, 1988, c.f. figs 12-14). Generic characters given by GUINOT (1967) to separate *Monodaeus* and *Medaeops* that I have found to be quite variable include : differences in the prominence of the carapace regions; degree to which the sternum is swollen; size of the lacina of the third maxilla; arrangement and size of the segments of the antennules and antennae; and the shape of the male G1.

*Medaeops* is here considered to include the following five species : *M. granulosus* (Haswell, 1882), type species; *M. neglectus* (Balss, 1922); *M. edwardsi* Guinot, 1967; *M. gemini* sp. nov.; and *M. merodontos* sp. nov.

#### Key to the species of *Medaeops*

1. Anterolateral teeth prominent and broad ..... 2  
 — Anterolateral teeth low and little produced beyond an evenly convex anterolateral margin.  
 ..... *M. edwardsi* Guinot, 1967
2. Walking legs distinctly carinate along anterior margins .. *M. granulosus* (Haswell, 1882)  
 — Walking legs not distinctly carinate along anterior margins ..... 3
3. Carapace region 4M distinct; walking legs with row of spaced teeth along anterior margins of meri ..... *M. merodontos* sp. nov.  
 — Carapace region 4M not distinct; walking legs with anterior margins of meri smooth or with at most large granules ..... 4
4. Carapace regions with granules arranged into raised transverse striations; frontal lobes separated by a narrow slit; walking legs relatively short and stout; abdominal segment 6 with concave margins ..... *M. neglectus* (Balss, 1922)  
 — Carapace regions evenly granular; frontal lobes separated by a broad notch; relatively longer, narrower walking legs; abdominal segment 6 having straight margins .....  
 ..... *M. gemini* sp. nov.



*Medaeops gemini* sp. nov.

Figs 7, 16c-d, f

**MATERIAL EXAMINED.** — **New Caledonia.** VOLSMAR, *mont Gemini*; stn DW 60, 20°59.9'S, 170°16.6'E, 80-190 m, 6.07.1989: 1 ♂ 20.1 x 13.6 mm (MNHN-B 22804); 1 ♂, 1 ♀ not measured because of carapace damage (MNHN-B 22805); 1 ♂ 9.8 x 7.0 mm (QM-W 20958); 1 ♂ 9.7 x 7.0 mm (USNM unreg.).

**TYPE SPECIMENS.** — The largest male (MNHN-B 22804) is the holotype; all other specimens are paratypes.

**DESCRIPTION.** — *Carapace.* Transversely ovoid; *c.* 1.5 times broader than long in holotype *c.* 1.4 in smaller paratypes. Carapace convex anteriorly, more-or-less flat from side-to-side across the posterobranchials. Regions well defined, elevated, separated by strong furrows; 1F and 2F confluent, sharply granular; 1M separated from 2M; 2M divided longitudinally over anterior two-thirds, outer lobe much broader; 4M not distinct; all anterolateral regions more-or-less defined; 1R and 2R not separated, divided from 3R by a broad oblique furrow; cardiac and intestinal regions distinct but not strongly marked; posterior margin costate, with a raised granular rim; posterolateral margins more-or-less straight. Anterolateral margins regularly convex; with six teeth behind the exorbital angle; margins granular, first and third teeth small, first well separated from orbit, and situated lateral to, and well below, level of orbit seen in frontal view; an ill-defined oblique granular ridge present anterior to first tooth and continuing on towards anterolateral corner of buccal frame; second and fourth to sixth teeth subequal, triangular, bluntly acute; greatest carapace width across last teeth. Front *c.* 0.3 times carapace width; not deflexed, bilobed, moderately projecting, granular; with prominent narrow lateral projections; pre-orbital sharply granular shoulder. Carapace surface with granular striations on anterior regions otherwise relatively smooth; with scattering of plumose setae. Upper orbital border concave, granular; median and lateral fissure vestigial, but noticeable. Lower orbital border inner angle formed by large triangular, bluntly pointed tooth; laterally with a second smaller blunt granular lobe; with V-shaped notch laterally. Antennal flagellum small and entering orbit, fine, reaching beyond orbit about level of first anterolateral tooth. Basal antennal segment touching front, rectangular, unarmed. Basal antennular segment with raised granular rim across upper and lateral margins, palp folding slightly obliquely.

*Third maxilliped.* Merus swollen medially, granular; *c.* 1.2 times wider than long; antero-external angle produced, blunt; *c.* 0.6 times length of ischium. Ischium sub-rectangular *c.* 1.5 times longer than wide.

*Chelipeds.* Unequal; large and robust; minor cheliped of similar form but with longer more slender fingers. Merus short and broad, posterior border granulate, with blunt subdistal shoulder and small distal tooth. Carpus with strong tooth at inner angle, without ventral tooth; upper and outer surfaces granular and rugose. Outer surface of palm covered in transverse granular striations, becoming more rugose dorso-proximally; with only scattered setae. Fixed finger with ventral ridge, and second longitudinal groove below cutting margin; length cutting edge *c.* 0.39 times length propodus. Ventral border of chela slightly concave at base of fixed finger. Dorsal surface of dactylus microscopically granular; dactylus broad, bearing 2 longitudinal grooves on outer face, running most of length. Fingers pointed, recurved; cutting margins of both fingers with molariform teeth; dactylus of major chela with slightly larger, blunt, backwardly projecting molar at base of cutting margin.

*Walking legs.* Medium length; compressed; relatively stout; first three pairs all of similar length, *c.* 1.1 times maximum carapace width. Merus of third leg of holotype *c.* 3.6 times longer than wide; carpus *c.* 2.5 times longer than wide; propodus *c.* 2.4 times longer than wide; dactylus *c.* 1.15 times length of propodus. Dactyli slender, straight, and flattened; terminating in an acute chitinous tip. Merus anterior margin terminating in a small, blunt lobe. Carpus with granular accessory carina on upper surface. All segments, except dactyli, more-or-less granular; short setae marginally, more-or-less completely covering dactyli; scattering of longer feathered setae.

*Male abdomen.* Relatively narrow; third to fifth segments fused; third segment the widest. Segments three-five tapering. Segment six *c.* 1.3 times wider than long. Telson longer and basally wider than segment 6, *c.* 1.3 times wider than long; evenly rounded.

*Gonopods.* G1 medium length, slender, curved, tip finely pointed; bearing single, long, plumose seta at base of aperture (see Figs 7g-h).



*Sternum*. Relatively broad, granular; deep, longitudinal, median cleft in front of telson; suture between segments 3/4 deeply incised laterally, shallow and indistinct medially.

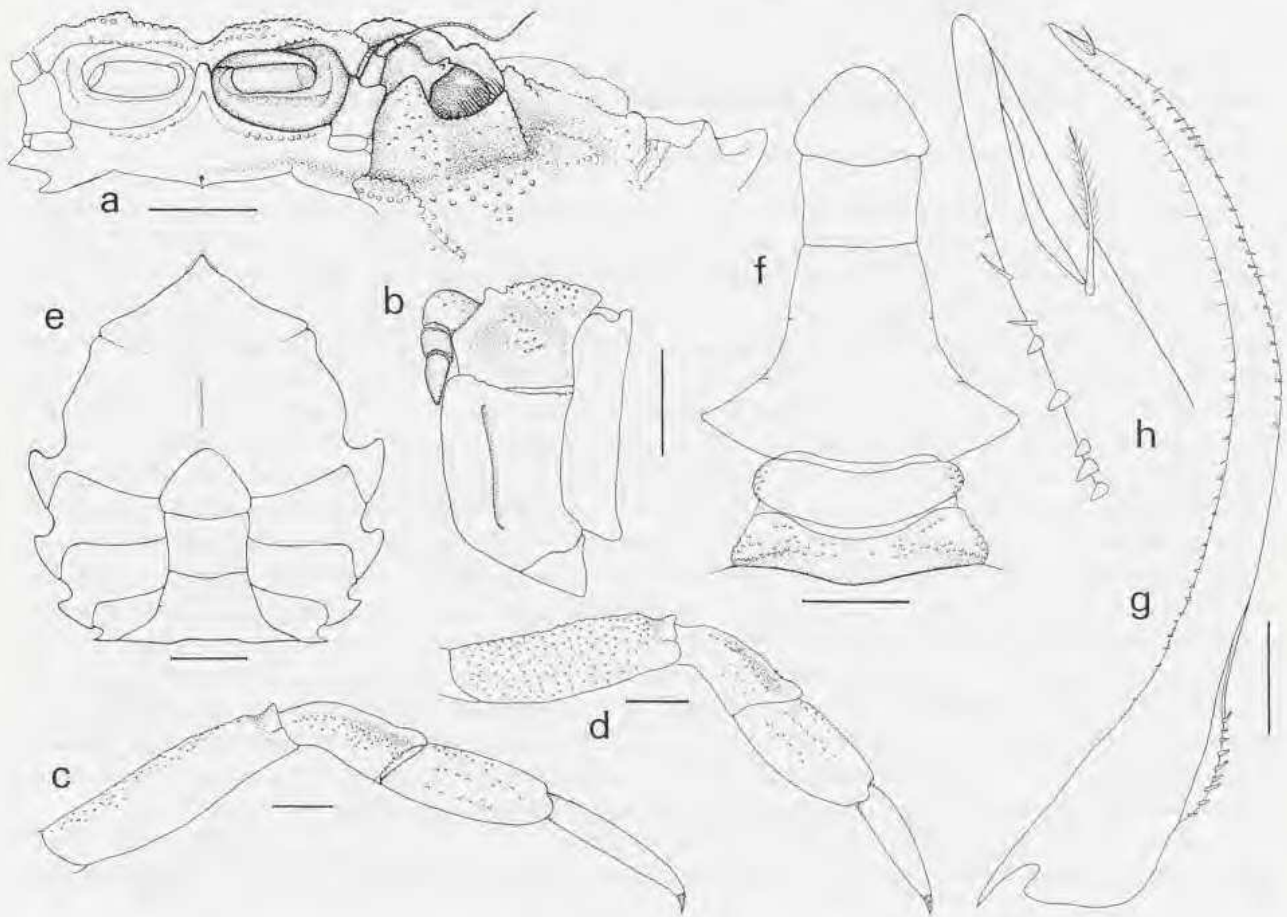


FIG. 7. — *Medaeops gemini* sp. nov., holotype : a, frontal view; b, third maxilliped (setae removed); c, third walking leg; d, fourth walking leg; e, sternum; f, abdomen; g-h, first gonopod and enlargement of tip. Scale line a-f = 2 mm; g = 0.5 mm.

ETYMOLOGY. — Named in reference to the locality where the species was collected, and used as a noun in apposition.

REMARKS. — *Medaeops granulosus* (Haswell, 1882) is clearly separated from *M. gemini* sp. nov. by having the walking legs distinctly carinate. *Medaeops edwardsi* Guinot, 1967, is also very different by having the anterolateral teeth very low, hardly interrupting the evenly convex anterolateral margins. Its nearest relative in appearance is *M. neglectus* (Balss, 1922) from which it differs by : having slightly more prominent and acute anterolateral teeth; carapace regions more-or-less evenly granular, not arranged into raised transverse striations; frontal lobes separated by a broad notch, not a narrow slit; longer, narrower walking legs; and abdominal segment 6 having straight, slightly divergent, not concave, margins. *Medaeops gemini* is also superficially similar to *Monodaeus pettersoni* Garth, 1985, from Easter Island, but in that species the carapace granulation is also arranged into striations, and the third maxilliped does not have its antero-external margin expanded.

DISTRIBUTION. — Only known from the type locality. Bathymetric range : 80-190 m.



*Medaeops merodontos* sp. nov.

Figs 8, 17d

MATERIAL EXAMINED. — **New Caledonia.** MUSORSTOM 4 : stn DW 151, 19°07.0'S, 163°22.0'E, 200 m, 14.09.1985 : 1 ♂ 14.0 x 9.8 mm, carapace intact but sternum separated and broken into several parts (MNHN-B 22808).

TYPE SPECIMEN. — The unique male is the holotype.

DESCRIPTION. — *Carapace.* Transversely ovoid; *c.* 1.4 times broader than long; convex anteriorly, and slightly from side-to-side. Regions well defined, elevated, separated by strong furrows; 1F and 2F not clearly separated, with irregular transverse rows of strong granules; 1M confluent with inner branch of 2M; 2M divided longitudinally over anterior two-thirds, outer lobe broader, itself less strongly anteriorly divided; 4M distinct, narrow, divided into three parts; all anterolateral regions more-or-less defined; 1R and 2R not separated, divided from 3R by deep oblique furrow; 1P and 2P distinct, 2P with laterally raised transverse crest; posterior margin costate, with a raised granular rim; posterolateral margins oblique, more-or-less straight. Anterolateral margins regularly convex; with five teeth behind the exorbital angle; margins granular, first and second teeth smallest subequal; first tooth well separated from orbit, and situated lateral to, and well below, level of orbit seen in frontal view; anterior to first tooth is an ill-defined oblique sulcus and granular ridge continuing on towards anterolateral corner of buccal frame; third to fifth teeth subequal, triangular, bluntly pointed; greatest carapace width across second last pair. Front *c.* 0.34 times carapace width; slightly deflexed, bilobed, moderately projecting, granular; median lobes sinuous, with broad U-shaped notch; prominent narrow lateral projections; pre-orbital granular projection. Carapace regions bluntly granular; more-or-less arranged into short, transverse, coarse striations on 2M; with scattering of plumose setae. Upper orbital border concave, granular; median and lateral fissure vestigial, but sulci noticeable. Lower orbital border inner angle formed by large triangular, bluntly pointed tooth; laterally with a second smaller blunt granular lobe; with V-shaped notch laterally. Antennal flagellum entering orbit, fine, reaching beyond orbit about level of first anterolateral tooth. Basal antennal segment touching front, rectangular, unarmed. Basal antennular segment with raised rim across upper and lateral margins, palp folding obliquely.

*Third maxilliped.* Merus surface sharply granular, swollen medially; *c.* 1.2 times wider than long; antero-external angle produced, blunt; *c.* 0.55 times length of ischium. Ischium sub-rectangular *c.* 1.5 times longer than wide.

*Chelipeds.* Right slightly the larger; both large and robust; minor cheliped of similar form but with longer more slender fingers. Merus short and broad, posterior border granulate, with subdistal shoulder bearing several acute granules; small triangular distal tooth. Carpus with strong tooth at inner angle, and slightly smaller tooth ventral to it; upper and outer surfaces granular and rugose. Outer surface of palm coarsely granular, with several shallow longitudinal sulci more-or-less distinct; with scattered plumose setae. Fixed finger with ventral ridge, and second longitudinal groove below cutting margin; length cutting edge *c.* 0.39 times length propodus. Ventral border of chela slightly concave at base of fixed finger. Dorsal surface of dactylus granular proximally; dactylus broad, bearing 2 major longitudinal grooves on outer face, running most of length; and less distinct groove above cutting margin. Fingers pointed, recurved; cutting margins of both fingers with molariform teeth; dactylus of major chela with larger, blunt, backwardly projecting molar at base of cutting margin.

*Walking legs.* Medium length; compressed; relatively stout; second pair slightly the longest, *c.* 1.2 times carapace width. Merus of third leg of holotype *c.* 3.2 times longer than wide; carpus *c.* 1.95 times longer than wide; propodus *c.* 2.0 times longer than wide; dactylus *c.* 1.3 times length of propodus. Dactyli slender, straight, and flattened; terminating in an acute chitinous tip. Merus anterior margin terminating in more-or-less acute lobe; anterior margin armed with small acute teeth. Carpus with accessory carina on upper surface; anterior margin lobulate, largest distally. All segments, except dactyli, more-or-less granular; short setae marginally, more-or-less completely covering dactyli; and larger part of propodi; scattering of longer feathered setae.

*Male abdomen.* Relatively narrow; third to fifth segments fused; third segment the widest. Segments three-five tapering. Segment six *c.* 1.45 times wider than long. Telson subequal in length to segment 6, *c.* 1.4 times wider than long; evenly rounded.



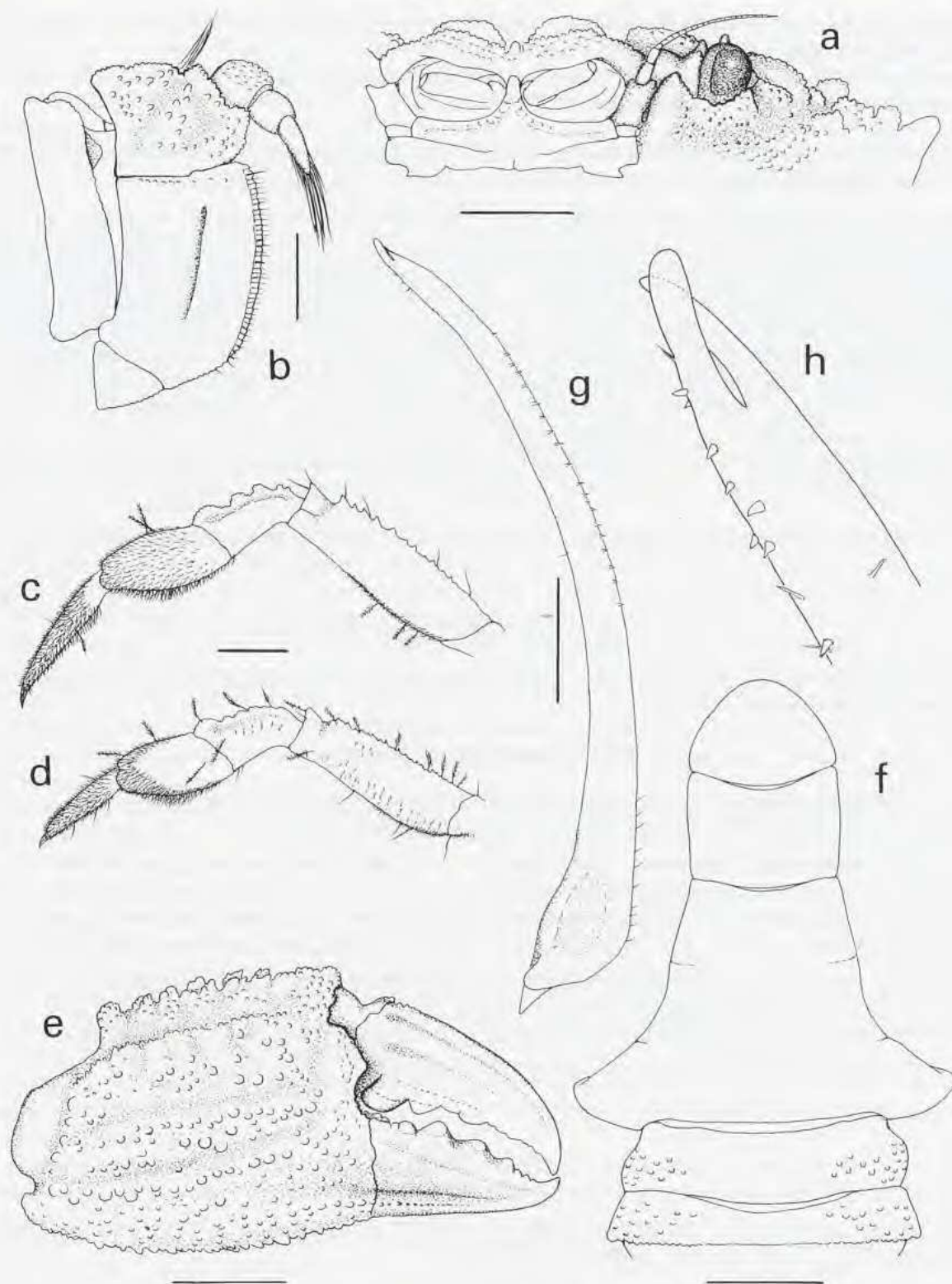


FIG. 8. — *Medaeops merodontos* sp. nov., holotype : a, frontal view; b, third maxilliped; c, third walking leg; d, fourth walking leg; e, right chela; f, abdomen; g-h, first gonopod and enlargement of tip. Scale line a, c-e = 2 mm; b, f, g = 1 mm.



*Gonopods*. G1 medium length, slender, curved, tip bluntly pointed; bearing short conical setae on ventro-distal margin and along distal half of dorsal margin (see Figs 8g-h).

*Sternum*. Relatively broad, granular; entirely covered with short setae; suture between segments 3/4 deeply incised laterally, more-or-less distinct medially.

ETYMOLOGY. — Name formed from the Greek *meros* (thigh) and *odontos* (tooth), and refers to the teeth on the meri of the walking legs, an important specific character. Used as a noun in apposition.

REMARKS. — *Medaeops granulosus* (Haswell, 1882) is clearly separated from *M. merodontos* sp. nov. by having the walking legs distinctly carinate. *Medaeops edwardsi* Guinot, 1967, is also very different by having the anterolateral teeth very low, hardly interrupting the evenly convex anterolateral margins. Its nearest relatives in appearance are *M. neglectus* (Balss, 1922) and *M. gemini* sp. nov., and it differs from both of these by having a relatively well defined carapace region 4M; and a row of distinct, acute teeth on the anterior margins of the meri of the walking legs. It differs from *M. neglectus* (Balss, 1922) by : carapace regions more coarsely granular, and lacking the fine transverse striations of that species; front relatively broader, and frontal lobes separated by a wide notch, not a narrow slit, and by having prominent narrow, triangular lateral teeth; slightly longer, less stout walking legs; and abdominal segment 6 having straight, not concave, margins.

It further differs from *M. gemini* by having less prominent and acute anterolateral teeth; carapace regions more coarsely granular; and the base of the telson being subequal in width to segment 6, not wider.

DISTRIBUTION. — Only known from the type locality, New Caledonia. Bathymetric range : 200 m.

#### Genus *MEDAEUS* Dana, 1851

*Medaeus* Dana, 1851 : 125; 1852 : 149, 181. — GUINOT, 1967a : 363, 373; 1971 : 1073. — SERÈNE, 1984 : 86-87. [synonymy not complete].

#### Key to the species of *Medaeus*

1. Frontal margin medially produced, laterally concave, and with prominent lateral lobes . 2  
— Frontal margin relatively straight, lateral angles not very strong ..... 3
2. Anterolateral teeth narrow, acute; upper surface of palm of chelipeds with inner and outer row of strong, granular lobes ..... *M. ornatus* Dana, 1852  
— Anterolateral teeth broadly triangular, blunt; upper surface of palm of chelipeds merely rugose ..... *M. elegans* A. Milne Edwards, 1867
3. Anterolateral teeth narrow, acute; meri of walking legs c. 3.3 times longer than wide; sixth abdominal segment c. 1.9 times wider than long ..... *M. aztec* sp. nov.  
— Anterolateral teeth broadly triangular; meri of walking legs c. 4 times longer than wide; sixth abdominal segment c. 1.7 times wider than long ..... *M. grandis* Davie, 1993

#### *Medaeus aztec* sp. nov.

Figs 9, 15a, 18d

MATERIAL EXAMINED. — New Caledonia. SMIB 8 : stn DW 183, banc Azteque, 23°18.3'S, 168°04.9'E, 330-367 m, 31.01.1993 : 1 ♂ 9.0 x 6.0 mm (MNHN-B 22807).

TYPE SPECIMEN. — The unique male is the holotype.

DESCRIPTION. — *Carapace*. Transversely ovoid; c. 1.5 times broader than long; convex anteriorly, and slightly from side-to-side. Regions moderately defined, elevated, separated by smooth furrows; 1F and 2F not clearly



separated, with irregular transverse rows of small granules; 1M confluent with inner branch of 2M; 2M divided longitudinally over anterior third, outer lobe broader, itself indistinctly anteriorly divided; 3M entire; 4M distinct, narrow, entire; all anterolateral regions more-or-less defined, 1L, and to a lesser extent 3L, with raised granular tooth; 1R and 2R not separated, divided from 3R by distinct oblique furrow; 1P and 2P distinct, both with sharp transverse crest; posterior margin costate, with raised microscopically granular rim; posterolateral margins oblique, more-or-less straight. Anterolateral margins regularly convex; with four teeth behind the exorbital angle; margins granular, third tooth largest, others subequal; first tooth well separated from orbit, situated slightly below level of orbit seen in frontal view; anterior to first tooth is an ill-defined oblique sulcus continuing towards anterolateral corner of buccal frame; greatest carapace width across third pair of teeth. Front *c.* 0.37 times carapace width; slightly deflexed, bilobed, little projecting, granular; obliquely receding either side of median V-shaped notch; prominent rounded lateral lobes; pre-orbital tooth triangular. Carapace regions granular; more-or-less arranged into short, transverse, coarse striations; without setae. Upper orbital border concave, granular; median and lateral fissures vestigial, but noticeable. Lower orbital border inner angle formed by large triangular, bluntly pointed tooth; laterally with a second smaller blunt granular lobe; with V-shaped notch laterally. Antennal flagellum entering orbit, fine, reaching to outer edge of orbit; basal antennal segment touching front, rectangular, unarmed. Basal antennular segment with raised rim across upper and lateral margins, palp folding obliquely.

*Third maxilliped.* Merus surface minutely granular, swollen medially; *c.* 1.2 times wider than long; antero-external angle not produced, rounded; anterior margin concave; length *c.* 0.55 times length of ischium. Ischium sub-rectangular *c.* 1.43 times longer than wide.

*Chelipeds.* Right cheliped missing; left (presumably minor) chela large and robust. Merus short and broad, posterior border with row of well-separated small spines, without terminal and subterminal teeth. Carpus with strong tooth at inner angle; with row of granules below it but without clearly defined ventral tooth; upper and outer surfaces coarsely rugose and granular. Outer surface of palm coarsely granular, with 4-5 longitudinal sulci more-or-less distinct; without setae. Fixed finger with ventral longitudinal sulcus and ridge, and second longitudinal groove below cutting margin; length cutting edge *c.* 0.4 times length propodus. Ventral border of chela slightly concave at base of fixed finger. Dorsal surface of dactylus granular proximally, becoming microscopically granular distally; dactylus broad, bearing 2 major longitudinal grooves on outer face, running most of length; and less distinct groove above cutting margin. Fingers pointed, recurved; inner margins of both fingers sharp, bearing cutting teeth not molars.

*Walking legs.* Medium length; compressed; first three pairs of similar length, slightly longer than carapace width. Merus of third leg of holotype *c.* 3.3 times longer than wide; carpus *c.* 2.1 times longer than wide; propodus *c.* 1.95 times longer than wide; dactylus *c.* 1.4 times length of propodus. Dactyli slender, straight, and flattened; terminating in an acute chitinous tip. Merus anterior margin terminating in bluntly rounded lobe; anterior margin armed with well-separated small acute teeth. Carpus with accessory carina on upper surface; anterior margin slightly lobulate, most noticeable distally; sharply granular. All segments, except dactyli, more-or-less granular, meri least so; scattering of long feathered setae; short setae marginally on dactyli.

*Male abdomen.* Relatively narrow; third to fifth segments fused; third segment the widest, broad flange laterally. Segments three-five tapering. Segment six *c.* 1.9 times wider than long. Telson *c.* 1.4 times longer than segment 6, *c.* 1.3 times wider than long; rounded.

*Gonopods.* G1 medium length, moderately stout, curved, tip bluntly pointed; subdistally with broad, triangular, dorsally directed flange; bearing row of moderately long, stout bristles, followed by long setae, subdistally on dorsal margin behind apex (see Fig. 9g, h).

*Sternum.* Relatively broad, shiny, microscopically granular; without setae; suture between segments 3/4 distinct laterally, more-or-less indistinct medially; telson reaching three-quarters of distance to suture 3/4.

**COLOUR.** — Carapace reddish-brown across front and onto first two pairs of anterolateral teeth, becoming predominantly dirty cream speckled with red posteriorly. Chelipeds reddish-brown with fingers dark brown. Walking legs pinky-purple except for cream coloured basis/ischium and cream bands near the joints.

**ETYMOLOGY.** — Named in reference to the name of the cruise during which the specimen was collected; it is used as a noun in apposition.



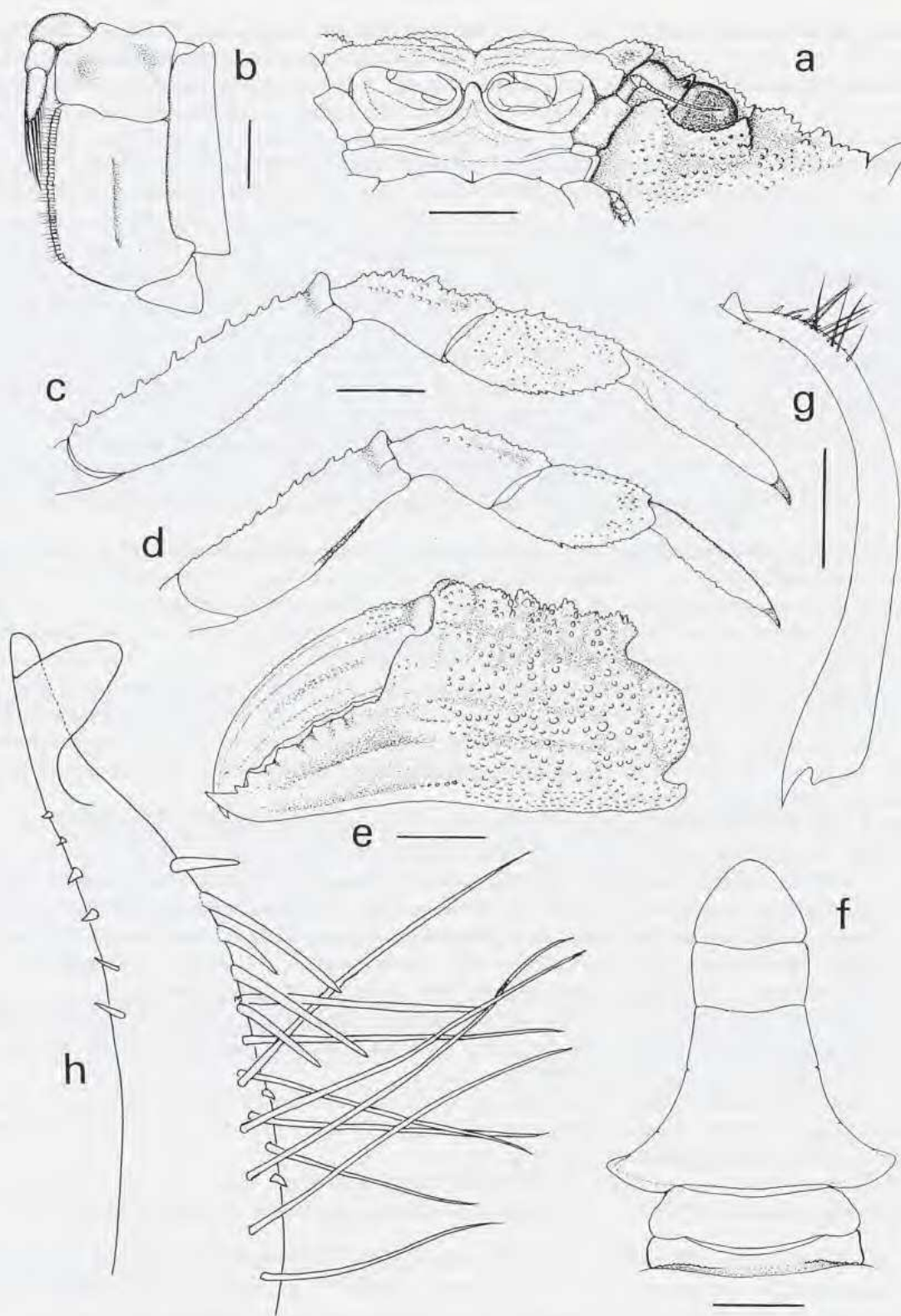


FIG. 9. — *Medaeus aztec* sp. nov., holotype : a, frontal view; b, third maxilliped; c, third walking leg; d, fourth walking leg; e, left chela; f, abdomen; g-h, first gonopod and enlargement of tip. Scale line a, c-f = 1 mm; b, g = 0.5 mm.



REMARKS. — *Medaeus aztec* sp. nov. is placed into *Medaeus* Dana, 1851, within the bounds of the current definition of the genus (GUINOT, 1967a). It has a relatively straight front, most like *Medaeus grandis* Davie, 1993, whereas the fronts of the two other species, *Medaeus ornatus* Dana, 1852, and *M. elegans* A. Milne Edwards, 1867, are more protruding. It differs from *M. grandis* by having sharper, narrower, anterolateral spines; less prominent carapace regions; shorter legs (merus of third leg 3.3 times longer than wide *versus* c. 4 times in *M. grandis*); and by having a wider sixth abdominal segment (breadth 1.9 times wider than long *versus* 1.7 in *M. grandis*). By the prominent, narrow, anterolateral spines it looks most like *M. ornatus*, but besides the strongly protuberant front, that species also has the chelipeds armed with strong granular lobes, which are absent in *M. aztec* sp. nov.

All four species share strong transverse carinae across both the cardiac and intestinal regions, and this separates them from the species in the genera *Monodaeus* and *Medaeops* which all seem to lack such carinae. This character has not been previously mentioned as being useful in defining the genus.

DISTRIBUTION. — Only known from the type locality in New Caledonia. Bathymetric range : 330-367 m.

#### Genus *MIERSIELLA* Guinot, 1967

##### *Miersiella haswelli* (Miers, 1886)

*Medaeus haswelli* Miers, 1886 : 117, pl. 11, fig. 2-2c. — MCNEILL, 1953 : 94, pl. 7, figs 3-4.

*Xanthias haswelli* - CALMAN, 1911 : 546-550, fig. 1.

*Platypilumnus haswelli* - BALSS, 1922 : 120.

*Miersiella haswelli* - GUINOT, 1967a : 359-362, figs 17-20.

*Miersella haswelli* - SERÈNE & VADON, 1981 : 122, 134, figs 2g-i, 3, pl. 3B.

MATERIAL EXAMINED. — **New Caledonia.** CHALCAL 2 : stn DW 72, 24°54.5'S, 168°22.3'E, 527 m, 28.10.1986 : 1 ♂ 6.1 mm (QM-W20586).

BATHUS 3 : stn CP 815, 23°47'S, 168°17'E, 460-470 m, 28.11.1993 : 1 ♂ 7.0 mm (MNHN-B 22742).

**Loyalty Islands.** MUSORSTOM 6 : stn DW 472, 21°08.6'S, 167°54.7'E, 300 m, 22.02.1989 : 1 ♂ 6.7 mm (MNHN-B 22800).

**Waterwitch Bank, SW Pacific.** MUSORSTOM 7 : stn DW 538, 12°31'S, 176°40'W, 275-295 m, 16.05.1992 : 1 ♂ 5.4 mm, 1 ♀ 6.5 mm (USNM unreg.).

**Wallis Island.** MUSORSTOM 7 : stn DW 610, 13°21'S, 176°09'W, 286 m, 26.05.1992 : 1 ♀ 6.1 x 4.5 mm (MNHN-B 22781).

DISTRIBUTION. — New South Wales, southeastern Australia (type locality); Christmas Island, northeastern Indian Ocean; Japan; Philippines; and now from New Caledonia, the Loyalty Islands, Norfolk Ridge, south of New Caledonia, and east to Wallis Island, and Waterwitch Bank. Bathymetric range : 80-527 m.

#### Genus *PARAMEDAEUS* Guinot, 1967

*Paramedaeus* Guinot, 1967 : 373. — SERÈNE, 1984 : 87.

REMARKS. — *Paramedaeus* Guinot, 1967, now contains five species : *P. simplex* (A. Milne Edwards, 1873) (type species), *P. noelensis* (Ward, 1942), *P. planifrons* (Sakai, 1965), *P. globosus* Serène & Vadon, 1981, and *P. megagomphios* sp. nov. described below.

#### Key to the species of *Paramedaeus*

- 1. Carapace relatively wide, c. 1.5 times or more wider than long ..... 2
- Carapace relatively more globular, distinctly less than 1.5 times wider than long ..... 3



2. Anterolateral teeth prominently projecting and armed with coarse accessory tubercles; carapace regions strongly projecting, rugose, with short, irregular, transverse rows of granules ..... *P. simplex* (A. Milne Edwards, 1873) (Madagascar; Mauritius; Somalia; Red Sea; Chagos Arch.; Ternate, Indonesia; Philippines; Upolu, Samoa; Hawaii).
- Anterolateral teeth not prominently projecting, more-or-less coalescent, with accessory granules; carapace regions not strongly projecting, evenly, and more finely, granular ..... *P. noelensis* (Ward, 1942) (Japan, Philippines, Tahiti, Samoa, Christmas Is., Mauritius, Red Sea — NG (1993) considers these records may be polyspecific).
3. Frontal lobes remarkably salient, directed laterally, with a deep, wide, median V-shaped notch, and similar deep notches, visible dorsally, separating them from pre-orbital teeth; anterolateral teeth in the form of very prominent broad triangular spines; carapace surface conspicuously granular ..... *P. planifrons* (Sakai, 1965) (Japan).
- Frontal lobes prominent but not remarkably salient, with a deep, median notch, but no V-shaped lateral notches visible in dorsal view; anterolateral teeth relatively low; carapace surface mostly only minutely granular ..... 4
4. Larger chela with an enormous quadrangular molar occupying proximal half of dactyl; carapace regions relatively poorly separated, in particular 1M and 2M confluent, 2M only partially divided, 2L and 5L low and rounded; meri of walking legs armed with row of low, small sharp tubercles ..... *P. megagomphios* sp. nov. (Futuna Is., SW Pacific).
- Larger chela without unusual dentition on cutting margins of fingers; carapace regions relatively strongly separated, in particular 1M and 2M separated, 2M completely divided, 2L in the form of a prominent blunt spine, and 5L bulbous; meri of walking legs strongly serrated ..... *P. globosus* Serène & Vadon, 1981 (Philippines, New Caledonia, and the Norfolk Ridge).

*Paramedaeus globosus* Serène & Vadon, 1981

*Paramedaeus planifrons globosus* Serène & Vadon, 1981 : 130, pl. 3A.

**MATERIAL EXAMINED.** — **New Caledonia.** MUSORSTOM 4 : stn 149, 19°07.6'S, 163°22.7'E, 155 m, 14.09.1985 : 1 ovig. ♀ 7.2 mm (MNHN-B 22745); 1 ♂ 7.5 mm (QM-W 20587). — Stn 203, 22°35.8'S, 167°04.8'E, 105-110 m, 27.09.1985 : 1 ♀ 6.4 mm, 1 ♂ 7.1 mm (QM-W 20582). — Stn 204, 22°37.0'S, 167°05.7'E, 120 m, 27.09.1985 : 1 ♂ 8.7 mm (MNHN-B 22750).

CHALCAL 2 : stn DW 70, 24°46.0'S, 168°09.0'E, 232 m, 27.10.1986 : 1 ovig. ♀ 5.8 mm, 1 ♂ 6.4 mm (MNHN-B 22749). — Stn DW 71, 24°42.26'S, 168°09.52'E, 230 m, 27.10.1986 : 1 ovig. ♀ 6.5 mm (MNHN-B 22746). — Stn DW 80, 23°26.7'S, 168°01.8'E, 160 m, 30.10.1986 : 1 ♂ 9.1 mm (USNM Unreg.).

SMIB 5 : stn DW 82, 22°31.7'S, 167°32.4'E, 155 m, 09.09.1989 : 1 ♂ 6.1 mm (MNHN-B 22748).

**Loyalty Islands.** MUSORSTOM 6 : stn DW 440, 20°48.8'S, 167°17.25'E, 288 m, 19.02.1989 : 1 ♂ 5.8 mm (MNHN-B 22747).

**REMARKS.** — *Paramedaeus globosus* was originally described as a subspecies of *P. planifrons* (Sakai, 1965). Considering that the present specimens agree precisely with the figure and diagnosis of SERÈNE & VADON (1981), and that it has maintained this integrity over such a large geographic area, it seems valid to treat it as a full species.

Following SERÈNE & VADON (1981) it can be separated from *Paramedaeus planifrons* by : (1) the front is much less produced beyond the orbits, with the median fissure, as a consequence being not as deep, and the median and lateral angles less pointed; the lateral cleft before the inner orbital angle is also not as strongly oblique; (2) the



inner and outer orbital angles are rounded instead of being sharply pointed; (3) the last three anterolateral teeth are less prominent and less sharp; (4) the carapace regions are more smoothly rounded, and centrally relatively smooth, without obviously strong granulation; three distinct small tubercles are present as an almost vertical row posterolaterally on the region 3R. The G1 seems of little use in separating the two species.

**DISTRIBUTION.** — Philippines (type locality), and now from New Caledonia and the Norfolk Ridge. Bathymetric range : 96-288 m.

*Paramedaeus megagomphios* sp. nov.

Fig. 10

**MATERIAL EXAMINED.** — **Futuna Island, SW Pacific.** MUSORSTOM 7 : stn DW 498, 14°19'S, 178°03'W, dredged, 105-160 m, 10.05.1992 : 1 ♀ 7.3 x 5.5 mm (MNHN-B 22787).

**TYPE SPECIMEN.** — The unique female is the holotype.

**DESCRIPTION.** — *Carapace.* Transversely ovoid; c. 1.3 times broader than long; convex longitudinally over anterior third, but only slightly from side to side. Regions well defined, elevated, separated by strong furrows; 1F and 2F confluent slightly elevated; 1M confluent with inner branch of 2M; 2M partially divided longitudinally with outer lobe much broader; 3M with narrow anterior prolongation; 4M not defined; anterolateral and posterolateral regions not defined except for lateral grooves between 2L and 5L, and between 2R and 3R; cardiac and intestinal regions defined only by broad shallow depressions; posterior margin costate; posterolateral margins straight or slightly convex. Anterolateral margins with five teeth behind the exorbital angle; margins coarsely granular, first tooth the smallest, well separated from orbit, and situated lateral to, and well below, level of orbit seen in frontal view; second tooth relatively close to first tooth, slightly larger; third tooth largest; fifth and sixth reducing slightly in size; all teeth sub-triangular, relatively acute; greatest carapace width across fourth teeth. Front 0.37 times carapace width; strongly projecting, granular; two broad lobes separated by very deep, broad V-shaped notch; each lobe with strongly oblique margins, more-or-less straight, ending in a large, broad, rounded pre-orbital tooth. Posterior margin costate. Carapace surface finely granulate except in smooth furrows separating regions, but becoming more sharply and coarsely granulate towards anterolateral margins; without setae. Upper orbital border granular; median and lateral fissures indistinct. Lower orbital border inner and outer angles formed by triangular, granular, pointed teeth, clearly visible dorsally. Antennal flagellum entering orbit, fine, reaching about width of orbit. Basal antennal segment touching front, minutely granular. Basal antennular segment with raised crest across upper and lateral margins almost forming oblique z-shape laterally, palp folding slightly obliquely. Lower margin of epistome strongly sinuous, projecting as thin rim.

*Third maxilliped.* Merus c. 1.2 times wider than long; antero-external angle not produced; c. 0.5 times length of ischium. Ischium sub-rectangular c. 1.6 times longer than wide.

*Chelipeds.* Markedly unequal; right chela the largest, strong and robust. Merus granular and pitted, posterior border bearing row of acute triangular tubercles; small granular distal tooth. Carpus with strong, slightly upturned, blunt tooth at inner angle; small granular elevation ventral to it; dorsal face rugose, granular and pitted. Outer surface of palm finely granular, without setae; moderately pitted in broad subdorsal longitudinal groove. Fixed finger long, with indistinct ventral ridge. Dorsal surface of dactylus minutely granular; dactylus very broad, indistinct median longitudinal groove. Fingers pointed, recurved, tips crossing; cutting margins of dactylus with 3 triangular teeth in distal half, increasing in size proximally, distal half entirely occupied by single very large quadrangular molar; cutting margin of fixed finger with broad flat shelf opposing molar of dactyl. Minor cheliped with more slender fingers; cutting margins jagged and sharp, lacking molar of large chela; longitudinal grooves more pronounced; surfaces more coarsely granular and pitting obvious over outer face of palm.

*Walking legs.* Medium length; compressed; slender; first three pairs all of similar length. Third leg : merus c. 3.3 times longer than wide; carpus c. 1.9 times longer than wide; propodus c. 1.8 times longer than wide; dactylus c. 1.4 times length of propodus. Dactyli stout, terminating in an acute chitinous tip. Meri anterior margins armed



with row of short sharp tubercles, terminating in blunt tooth. Carpi with anterior margins bilobed; accessory carinae on upper surface. All segments with small sharp granules. Short feathered setae marginally on most segments, more-or-less covering dactyli.

*Sternum*. Relatively broad, smoothly and finely granular.

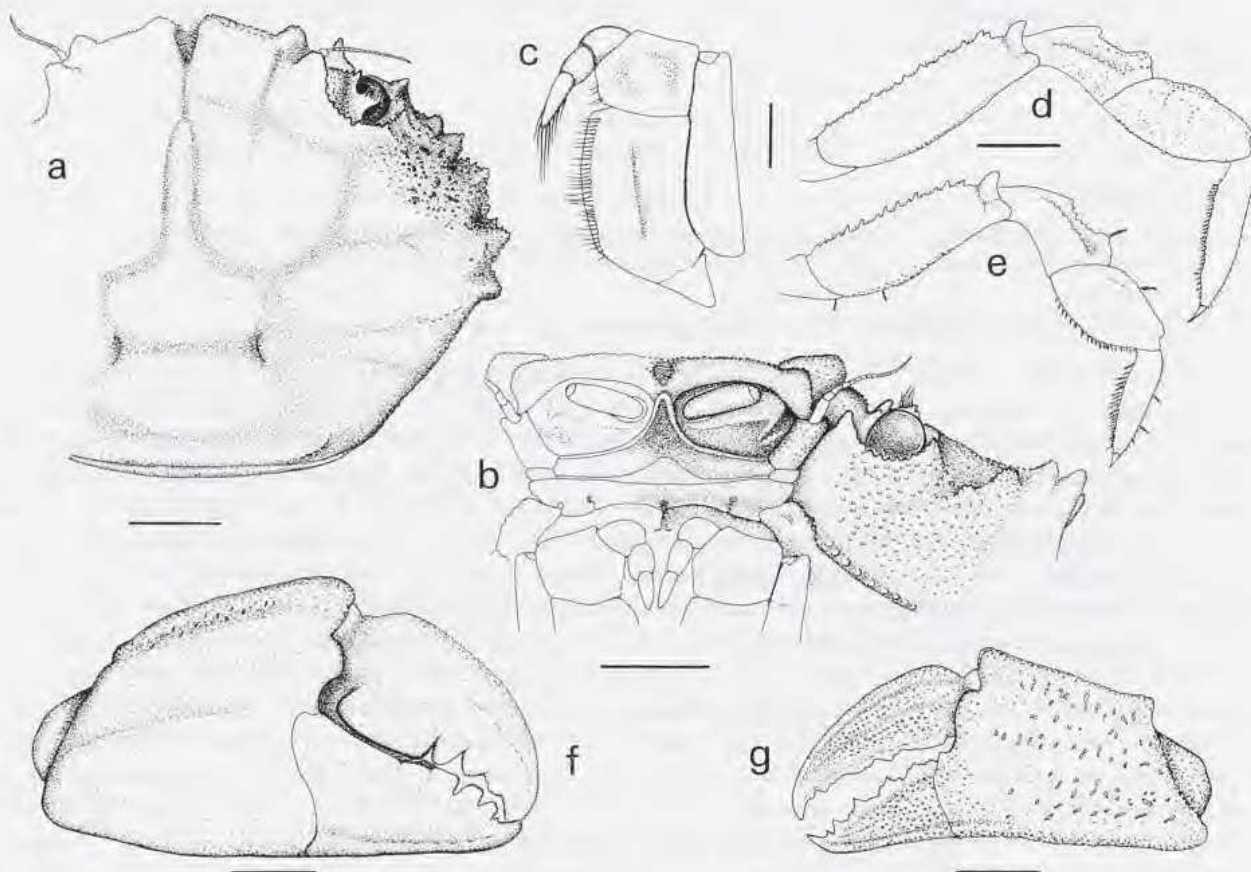


FIG. 10. — *Paramedaeus megagomphios* sp. nov., holotype : a, dorsal carapace; b, frontal view; c, third maxilliped; d, third walking leg; e, fourth walking leg; f, right chela; g, left chela. Scale line a, b, d-g = 1 mm; c = 0.5 mm.

**ETYMOLOGY.** — Formed from the Greek *mega* (large) and *gomphios* (molar). Named in reference to the enormous molariform tooth near the base of the dactylus of the cheliped. It is used as a noun in apposition.

**REMARKS.** — *Paramedaeus megagomphios* sp. nov. is easily separated from all other known species of *Paramedaeus* by the enormous molariform tooth on the dactylus of the larger cheliped. It is closest in appearance to *P. globosus* in the shape of the carapace and front, but differs from that species by having less strongly defined carapace regions, in particular 1M and 2M are confluent, 2M is only partially divided, and 2L and 5L are low and rounded. On *P. globosus* the carapace regions are relatively strongly separated, in particular 1M and 2M are distinct, 2M is completely divided, 2L is in the form of a prominent blunt spine, and 5L is bulbous. Also the meri of the walking legs are armed with a row of low, small sharp tubercles in *P. megagomphios*, but are strongly serrated in *P. globosus*.

**DISTRIBUTION.** — Only known from waters off Futuna Island, south-western Pacific. Bathymetric range : 105-160 m.



Genus *PARAXANTHODES* Guinot, 1968*Paraxanthodes cumatodes* (MacGilchrist, 1905)

*Xanthodes cumatodes* MacGilchrist, 1905 : 258. — ALCOCK & ANNANDALE, 1907, pl. 79, fig. 1. — BALSS, 1929 : 24.

*Xanthias cumatodes* - STEPHENSEN, 1945 : 148. — GUINOT, 1967b : 269.

*Paraxanthodes cumatodes* - GUINOT, 1968 : 723, fig. 60. — SERÈNE, 1984 : 209, pl. 30C.

**MATERIAL EXAMINED.** — **New Caledonia.** MUSORSTOM 4 : stn 149, 19°07.6'S, 163°22.7'E, 155 m, 14.09.1985 : 3 ♂ 4.7, 6.3, 8.2 mm, 1 imm. ♀ 4.3 mm (MNHN-B 22751); 1 ♂ 3.5 mm (MNHN-B 22752); 3 imm. 2.9, 3.3, 4.1 mm, 1 ♀ 6.0 mm (MNHN-B 22755). — Stn 151, 19°07.0'S, 163°22.0'E, 200 m, 14.09.1985 : 1 ♂ 12.0 mm, 1 ♀ 9.0 mm (USNM Unreg.). — Stn 187, 19°08.3'S, 163°29.3'E, 65-120 m, 19.09.1985 : 2 ♂ 6.9, 9.6 mm, 3 ♀ 5.7, 5.8, 5.8 mm (MNHN-B 22753); 3 ♀ 7.7, 8.0, 8.1 mm, 2 ♂ 6.9, 9.6 mm (MNHN-B 22753); 2 ♂ 9.3, 11.6 mm, 3 ♀ 7.7, 8.0, 8.1 mm (QM-W20584). — Stn 189, 19°07.5'S, 163°29.0'E, 210 m, 19.09.1985 : 1 ♂ 8.3 mm, 1 ovig. ♀ 9.5 mm (MNHN-B 22757). — Stn 205, 22°38.5'S, 167°06.8'E, 140-160 m, 27.09.1985 : 5 ♀ 5.7, 6.0, 6.8, 9.9, 10.0 mm (USNM Unreg.).

CHALCAL 2 : stn DW 80, 23°26.7'S, 168°01.8'E, 160 m, 30.10.1986 : 1 ♀ 7.4 mm (MNHN-B 22754).

SMIB 6 : stn DW 106, 19°08.1'S, 163°30.7'E, 165-195 m, 2.03.1990 : 2 ♂ 10.5, 10.1 mm (MNHN-B 22756).

**REMARKS.** — The present series of specimens is only the third collection to be reported on, and the first from the Pacific Ocean. The earlier records of MACGILCHRIST (1905) and BALSS (1929) were from the Persian Gulf and the Red Sea respectively.

The Pacific specimens differ in minor details from the female specimen of BALSS (1929) which is now housed in the MNHN, Paris (MNHN-B 13054), but which now lacks claws and some legs. There is however some variation amongst the present Pacific specimens. In particular the first anterolateral tooth of the carapace varies from being obviously connected to the exorbital margin by a low carina, through to being clearly separated from it; and as a consequence the subhepatic tubercle is more-or-less obvious in the gap. In the Red Sea female the first anterolateral tooth is almost completely separate, and the subhepatic tubercle is very clearly seen in the gap. The shape of the front varies from being almost straight to being moderately prominent medially, and the median incision varies from very narrow to a relatively broad v-shaped notch. On the Red Sea female the carapace regions have rows of fine granules that do not seem to so obviously fuse into the characteristic "wavelets or ripples moving in a forward direction" described for the type material (MACGILCHRIST, 1905) and which is clearly represented on the Pacific material. Finally, the proportions of the meri of the walking legs seem to vary slightly, with the P5 of the Red Sea specimen having the merus slightly shorter than the figured syntype (ALCOCK & ANNANDALE, 1907, pl. 79, fig. 1), and most of the present material, although in the present series there is a gradation between both states.

On the largest males the outer-face of the palm of the cheliped has the three parallel longitudinal furrows less obviously demarcated, and the granules lower and smoother such that it appears quite smooth, especially on the lower half.

It is clear to me that *Paraxanthodes* is most closely related to *Alainodaeus*, *Medaeus*, *Medaeops*, *Paramedaeus*, and *Monodaeus* than to *Xanthias* and *Paraxanthias* to which it has been allied in the past (GUINOT, 1967a), and therefore it should be transferred to the Euxanthinae. The division that separates this group from the Xanthinae proper is very tenuous, however I believe these five genera at least form a monophyletic grouping. This conclusion is based on the general conformation of the carapace, sternum, male abdomen shape, and the euxanthine condition of having the first anterolateral tooth separated from the exorbital margin such that the anterolateral margin is continued towards the anterior buccal cavity. This last character is not as strong for this group of genera as it is for the central core of euxanthine genera (like *Carpoporus*, *Epistocavea*, *Euxanthus*, *Glyptoxanthus*, *Guinotellus*, *Hepatoporus*, and *Hypocolpus*) and can be difficult to appreciate on some species.

**DISTRIBUTION.** — Persian Gulf (type locality); Red Sea; and now from New Caledonia in the south-western Pacific. Bathymetric range : 65-210 m.



## Subfamily LIOMERINAE Sakai, 1976

Genus *LIOMERA* Dana, 1851*Liomera (Liomera) nigrimanus* sp. nov.

Figs 11, 15d, 18e

*Carpilodes virgatus* - RATHBUN, 1911 : 212. — ODHNER, 1925 : 16, pl. 1, fig. 8.*Liomera virgata* - GUINOT, 1967b : 266. — SERÈNE, 1984 : 60, pl. 9 D-E.Not *Carpilodes virgatus* Rathbun, 1906.

MATERIAL EXAMINED. — New Caledonia. SMIB 8 : Azteque Bank, stn DW 183, 23°18.3'S, 168°04.9'E, 330-367 m, 31.01.1993 : 1 ♂ 14.7 x 9.0 mm (MNHN-B 22758).

TYPE SPECIMEN. — The unique male is the holotype.

DESCRIPTION. — *Carapace*. Transversely ovoid; *c.* 1.63 times broader than long; anteriorly convex longitudinally, flat from side to side across postero-branchials. Regions strongly defined; 1F and 2F confluent, moderately swollen, not separated from frontal margin; 1M moderately swollen and separated by broad shallow groove from inner branch of 2M; 2M longitudinally divided over most of its length by deep groove, outer branch of 2M wider than inner branch; orbital margin swollen; 1L low, connected to lateral margin of orbit; 2L, 3L, 5L and 6L all distinct; 4L confluent with third anterolateral tooth; cardiac and intestinal regions defined by diffused grooves. Anterolateral margins regularly convex; four rounded lobes behind exorbital angle; margins rounded; first tooth slightly smaller, others subequal; carapace width slightly greatest between fourth teeth. Front *c.* 0.34 times carapace width, moderately projecting, bilobed; pre-orbital teeth in form of broad rounded lobe. Carapace surface smooth, finely punctate, without setae. Upper orbital border concave, smooth, low lobe dorsally behind cornea, median and lateral fissures absent. Lower orbital border with inner angle formed by blunt triangular lobe. Antennal flagellum small and entering orbit, not reaching beyond orbit. Basal antennal segment in broad contact with front. Basal antennular segment with palp folding slightly obliquely.

*Third maxilliped*. Merus wider than long, length *c.* 0.73 times breadth; *c.* 0.5 times length of ischium. Ischium rectangular, length *c.* 1.4 times breadth.

*Chelipeds*. Sub-equal; palm relatively slender, height *c.* 0.35 times length (including fixed finger). Merus with margins rounded, finely granulate. Carpus granulate at inner angle, but rounded and unarmed; outer margin and upper surface smooth, uneven, finely punctate. Outer surface of palm minutely granular, strong, short, vertical punctations; without setae; inner surface more coarsely granular. Fixed finger moderately long; ventral ridge poorly defined. Ventral border of chela concave at base of fixed finger. Dactylus with sub-supramarginal groove relatively well defined. Fingers spooned, with edges sharp; narrow gape between cutting margins.

*Walking legs*. Medium length, stout, rounded, unarmed, margins microscopically granular; first pair slightly the longest. Merus of third leg *c.* 2.9 times longer than wide; carpus *c.* 1.8 times longer than wide; propodus *c.* 1.7 times longer than wide; dactylus *c.* 1.2 times length of propodus. Dactyli straight, terminating in an acute chitinous tip. Carpi without accessory carinae on upper surface, but with slight distal depression.

*Male abdomen*. Third to fifth segments fused; first and third segments subequal in width. Segments three-five tapering, slightly sinuous. Segment six *c.* 1.4 times wider than long. Telson about as long as wide; *c.* 1.25 times longer than segment 6.

*Gonopods*. G1 long, moderately stout, sinuous; tip flanged, appearing papillate on inner abdominal margin. Long setae distally (see Fig. 11g-h). G2 evenly curved; tip short.

*Sternum*. Relatively broad, microscopically granular; base of telson adjacent to suture between segments 4 and 5.

COLOUR. — Dorsal carapace predominantly red but with some small narrow cream patches lateral to metagastric and cardiac regions, a median longitudinal cream band bisecting the intestinal region and continuing onto the abdomen, and some other sparse speckling. Chelipeds red, as on the carapace, but (at least in adult males)



with the black colour of the fixed finger extending backwards and forming a band completely encircling the palm and leaving only a narrow streak at each end. Walking legs also red except for cream coloured bands near the joints.

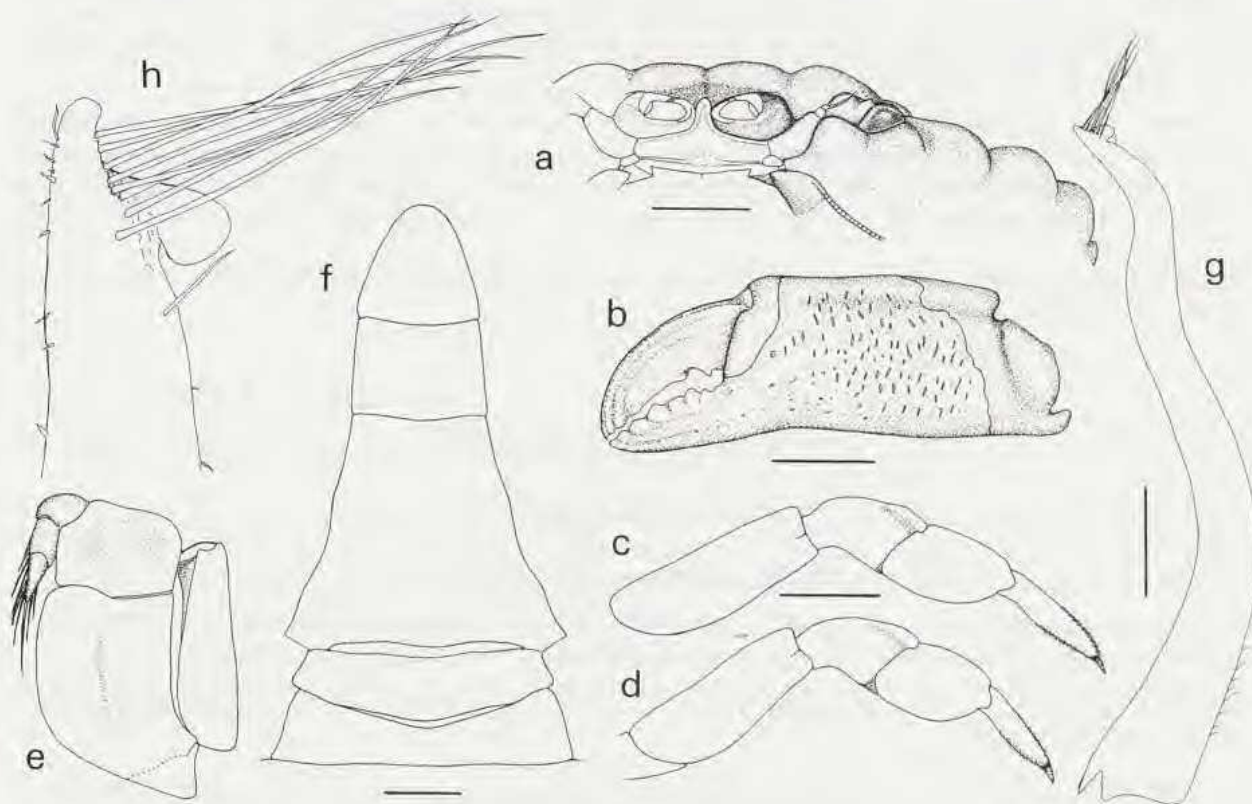


FIG. 11. — *Liomera nigrimanus* sp. nov., holotype: a, frontal view; b, left chela; c, third walking leg; d, fourth walking leg; e, third maxilliped; f, abdomen; g-h, first gonopod and enlargement of tip. Scale line a-d = 2 mm; e, f = 1 mm; g = 0.5 mm.

ETYMOLOGY. — Named in reference to the broad black band that encircles the palm of the cheliped.

REMARKS. — *Liomera nigrimanus* sp. nov. is most closely related to *L. virgata* (Rathbun, 1906) described from Hawaii. In particular the characteristic colouring is apparently very similar i.e. bright scarlet which persists in alcohol, and five or six bands of buff on the legs.

In all obvious characteristics the present specimen agrees precisely with the specimen figured by ODHNER (1925) from Macclesfield Bank, South China Sea, and the two specimens figured by SERÈNE (1984), one from Amirante Is., Seychelles, and the other from Holothuria Bank, South China Sea, the former being the same specimen that was identified by RATHBUN (1911) as *L. virgata*.

SERÈNE noted that the adult males of *Liomera virgata* were easily recognised by the black colour of the fixed finger extending backwards and forming a band completely encircling the palm, as it does on the present crab. Contrary to this, RATHBUN's (1906) type was a larger male than those available to SERÈNE, and apparently from her description the black band reached only two-thirds of the height of the palm and thus did not encircle it dorsally. Similarly EDMONDSON (1962) remarked only that the black of the fixed finger extended far back on the palm, and not that it encircled it. However ODHNER (1925), who also had an Hawaiian specimen at his disposal, said that it was the black bands on the male chela, that left only narrow streaks at each end, that confirmed the identity of *all* his specimens as being *L. virgata*. Nevertheless the colour of the male chela is not enough to use as a specific character when there is a much more significant morphological difference.



The present specimen and those of ODHNER (1925) and SERÈNE (1984) differ from RATHBUN's type in the shape of dorsal carapace region 2L, which RATHBUN describes as wider, and not dimpled; her figure shows that 2L and 3L are fused. EDMONDSON (1962) recorded several other specimens from Hawaii, and his figure is consistent with RATHBUN's in the form of 2L. In all the other non-Hawaiian specimens 2L is narrow, and 3L is very distinctly and completely separated. This was previously remarked on by ODHNER (1925), who nevertheless accepted RATHBUN's identification as being correct.

It seems clear, now that specimens are available from a variety of localities, that what was considered *L. virgata* is comprised of two distinct species - a new species, *L. nigrimanus*, which is widespread from the Seychelles in the Indian Ocean, to South China Sea and south to New Caledonia, in the Western Pacific; and *L. virgata* which is still only known from Hawaiian waters.

DISTRIBUTION. — New Caledonia; Holothuria and Macclesfield Banks, South China Sea; Amirante Is., Seychelles. Bathymetric range : 45-367 m.

#### Subfamily XANTHINAE MacLeay, 1838

#### Genus *DEMANIA* Laurie, 1906

#### *Demanía intermedia* Guinot, 1969

*Demanía intermedia* Guinot, 1969 : 236, figs 9, 17; 1979 : 61, pl. 5, fig. 3. — SERÈNE & LOHAVANIJAYA, 1973 : 61. — SERÈNE & VADON, 1981 : 122, 126. — GUINOT & RICHER DE FORGES, 1981 : 1118-1119, fig. 2 G-I, pl. 1, 1, 1a.

MATERIAL EXAMINED. — **New Caledonia**. VOLSMAR : stn CAS 58, 20°59.6'S, 170°17.4'E, 180 m, 06.07.1989 : 1 ♂ 60.3 mm (MNHN-B 22743).

DISTRIBUTION. — Papua New Guinea (type locality), New Caledonia and the Loyalty Islands. Bathymetric range : 180-200 m.

#### *Demanía mortenseni* (Odhner, 1925)

*Actaea mortenseni* Odhner, 1925 : 51-52, pl. 5, fig. 9.

[*Actaea*] *mortenseni* - GUINOT, 1976 : 204, pl. 19, fig. 4, 4a.

*Demanía mortenseni* - DAVIE, 1993 : 508-511, fig. 3, pl. 3.

MATERIAL EXAMINED. — **Loyalty Islands**. MUSORSTOM 6 : stn DW 398, 20°47.19'S, 167°05.65'E, 370 m, 13.02.1989 : 1 ♀ 8.7 mm (MNHN-B 22744).

REMARKS. — DAVIE (1993) has described, figured, and discussed this species in detail. I considered that it was most closely related to some of the *Demanía* species, although this genus is in need of revision.

DISTRIBUTION. — Kei Islands, Micronesia, (5°37'10"S, 132°23'W), type locality, east to Tuamotu Archipelago, French Polynesia (21°47'S, 138°52'W), and now from the Loyalty Islands, New Caledonia. Bathymetric range : 200-370 m.

#### *Demanía wardi* Garth & Ng, 1985

*Demanía wardi* Garth & Ng, 1985 : 294-296, figs 3 D-E, pls 2 C-D.

MATERIAL EXAMINED. — **New Caledonia**. HALIPRO 1 : stn CP 854, 21°45.37'S, 166°38.34'E, 650-780 m, 19.03.1994 : 1 ♀ 39.8 x 29.9 mm (MNHN-B 22806).



REMARKS. — This is only the second live specimen to be recorded of this species which is thus now known from two females and a fossil. The present specimen agrees very closely with the type description, and shows all the differences listed by GARTH & NG (1985) which separate it from its closest ally, *D. rotundata* (Serène, 1969) [in GUINOT, 1969]. The only discernible difference between the present specimen and the type of *D. wardi* is an apparently slightly narrower anterior projection of 3M. Without male specimens, and a generally greater range of specimens available, it is not possible to assess if this is significant, and it must be attributed to an inter-populational difference.

DISTRIBUTION. — Suva, Fiji; New Hebrides (as a Pleistocene fossil); and now New Caledonia. Bathymetric range : 200-400 (holotype), now extended to 780 m.

### Genus *EURYXANTHOPS* Garth & Kim, 1983

*Euryxanthops* Garth & Kim, 1983 : 673.

TYPE SPECIES by original designation, *E. orientalis* (Sakai, 1939).

REMARKS. — With the two new species described in this paper, *Euryxanthops* now contains five species : *Euryxanthops orientalis* (Sakai, 1939) from Japan (type of the genus); two species from the Philippines, *E. dorsiconvexus* Garth & Kim, 1983, and *E. flexidentatus* Garth & Kim, 1983; *E. latifrons* sp. nov. from Loyalty Islands; and *E. cepros* sp. nov. from the Seychelles.

*Euryxanthops* has so far proved to be an essentially deep water genus. *E. orientalis* has been taken from 85-400 m, *E. dorsiconvexus* from 550 m, *E. flexidentatus* from 336 m, *E. cepros* from 250-300 m and now *E. latifrons* from 261 m.

### Key to the species of *Euryxanthops*

1. Anterolateral lobes almost confluent, so as to form an almost evenly convex margin, and separated by only small notches ..... *E. cepros* sp. nov. (Seychelles).  
— Anterolateral lobes well defined, more-or-less prominent, and all clearly and broadly separated ..... 2
2. Front markedly produced beyond the general carapace outline, a distinct median incision separating two lobes with their margins laterally sloping; 2M anteriorly divided ..... *E. orientalis* (Sakai, 1939) (Japan; Philippines).  
— Front not markedly produced beyond the general carapace outline, composed of two more-or-less straight lobes, without a strong median incision; 2M entire ..... 3
3. Front relatively broad (c. 0.34 times carapace width); anterolateral margin behind exorbital angle markedly sloping backwards; legs relatively broad (merus of fourth walking leg c. 2.8 times longer than wide) ..... *E. latifrons* sp. nov. (Loyalty Islands).  
— Front narrower (< 0.3 times carapace width); anterolateral margin behind exorbital angle only moderately sloping backwards, nearly horizontal, or even projecting slightly forwards; legs narrower (merus of fourth walking leg > 3.5 times longer than wide) ..... 4
4. Anterolateral margin behind exorbital angle moderately sloping backwards such that apex of first anterolateral tooth is level with, or only slightly posterior to, rear margin of orbital cup ..... *E. dorsiconvexus* Garth & Kim, 1983 (Philippines).  
— Anterolateral margin behind exorbital angle nearly horizontal, or even projecting slightly forwards, such that apex of first anterolateral tooth is level with, or slightly in advance of exorbital angle ..... *E. flexidentatus* Garth & Kim, 1983 (Philippines).



*Euryxanthops latifrons* sp. nov.

Figs 12, 17b, 18f

**MATERIAL EXAMINED.** — **Loyalty Islands.** MUSORSTOM 6 : stn CP 445, 20°54.29'S, 167°17.16'E, 261 m, 19.02.1989 : 1 ♀ 13.7 x 9.6 mm (MNHN-B 22785).

**TYPE SPECIMEN.** — The unique female specimen is the holotype.

**DESCRIPTION.** — *Carapace.* Transversely ovoid, *c.* 1.43 times broader than long; appearing smooth but microscopically granular; very short setae between anterolateral teeth otherwise bare; convex anteriorly, slightly convex from side to side across postero-branchial regions. Regions poorly indicated, mostly marked by broad shallow smooth grooves; 1F and 2F confluent; 1M barely indicated, 2M broad, entire; 3M well marked, anterior prolongation narrow, with slightly convex margins; moderately deep, well defined, lateral gastro-cardiac and cardio-intestinal depressed grooves; 4M slightly indicated; 1L-5L all more-or-less separated; 1R and 2R confluent, separated from 3R by distinct lateral groove. Anterolateral border of carapace crested, slightly upturned; divided into four broad teeth; first tooth with slightly longest margin, confluent with exorbital angle, most produced near junction with second tooth; second tooth broad with low, rounded, median prominence; third tooth slightly smaller, triangular, blunt; fourth tooth smallest but prominent. Greatest carapace width across third teeth. Posterolateral border straight, slightly longer than anterolateral. Posterior border costate. Front produced, straight divided into two lobes by small notch; 0.34 times carapace width; laterally separated from prominent supra-orbital eaves. Supra-orbital border minutely granular, with two lateral closed fissures; infra-orbital border minutely granular, sinuous, with large triangular tooth at inner end visible dorsally, and deep notch below exorbital angle. Eyestalk with small tubercles on antero-distal margin behind cornea. Basal antennal segment with small sharp distal granules; touching front; flagellum fine, slightly wider than orbit. Basal segment of antennule with two strong lateral crests; flagellum folding obliquely.

*Third maxilliped.* Merus with surface covered in small sharp granules, especially distally; *c.* 0.6 length of ischium; wider than long; anteroexternal angle markedly produced, bluntly rounded. Ischium *c.* 1.4 times longer than wide.

*Chelipeds.* Noticeably unequal, right largest and stoutest; appearing smooth but microscopically granular. Merus of right cheliped short, not markedly projecting beyond edge of carapace, margins granular, upper border sharply crested, crest ending subterminally. Carpus swollen, smoothly rounded, bearing a strong triangular tooth at inner angle, and a smaller tooth below it. Palm high, height *c.* 0.5 times length (including fixed finger); evenly rounded except for broad shallow longitudinal depression before upper margin; immoveable finger relatively short and stout, ventral sub-marginal groove, cutting edge with largest teeth in proximal third. Dactylus longer, stout, rounded, with a broad, blunt longitudinal ridge defined proximally, indicated merely by row of punctuations distally; cutting margin with a few low rounded teeth distally and large, blunt, outwardly and backwardly projecting molar basally. Left cheliped of same form but fingers thinner and cutting margins sharper; dactylus lacking basal molar. Fingers of both chelae brown; colour of fixed finger not extending backwards beyond gape.

*Walking legs.* Medium length, first three pairs subequal, fourth pair slightly shorter. Margins of meri, carpi, and propodi sharply crested. Thick short setae on anterior margins of carpi and propodi, on posterior margins of propodi, and completely covering dactyli. Third leg of holotype with the following proportions : merus *c.* 2.7 times longer than wide; carpus *c.* 1.9 times longer than wide; propodus 1.8 times longer than wide (measured in mid-line); dactylus *c.* 1.3 times longer than propodus.

*Sternum* (of female holotype). With groove separating fused sternites 3/4 strongly incised laterally, and clearly marked across most of width; short deep longitudinal fissure on sternite 4.

**COLOUR.** — Dorsal carapace and chelipeds predominantly orange-brown lightly speckled with cream; legs generally less darkly coloured but darker towards distal end of meri and on carpi.

**ETYMOLOGY.** — The name is formed from the latin *latus* (broad) and *frons* (forehead, front), and refers to the relatively wider front of this species when compared with its congeners.



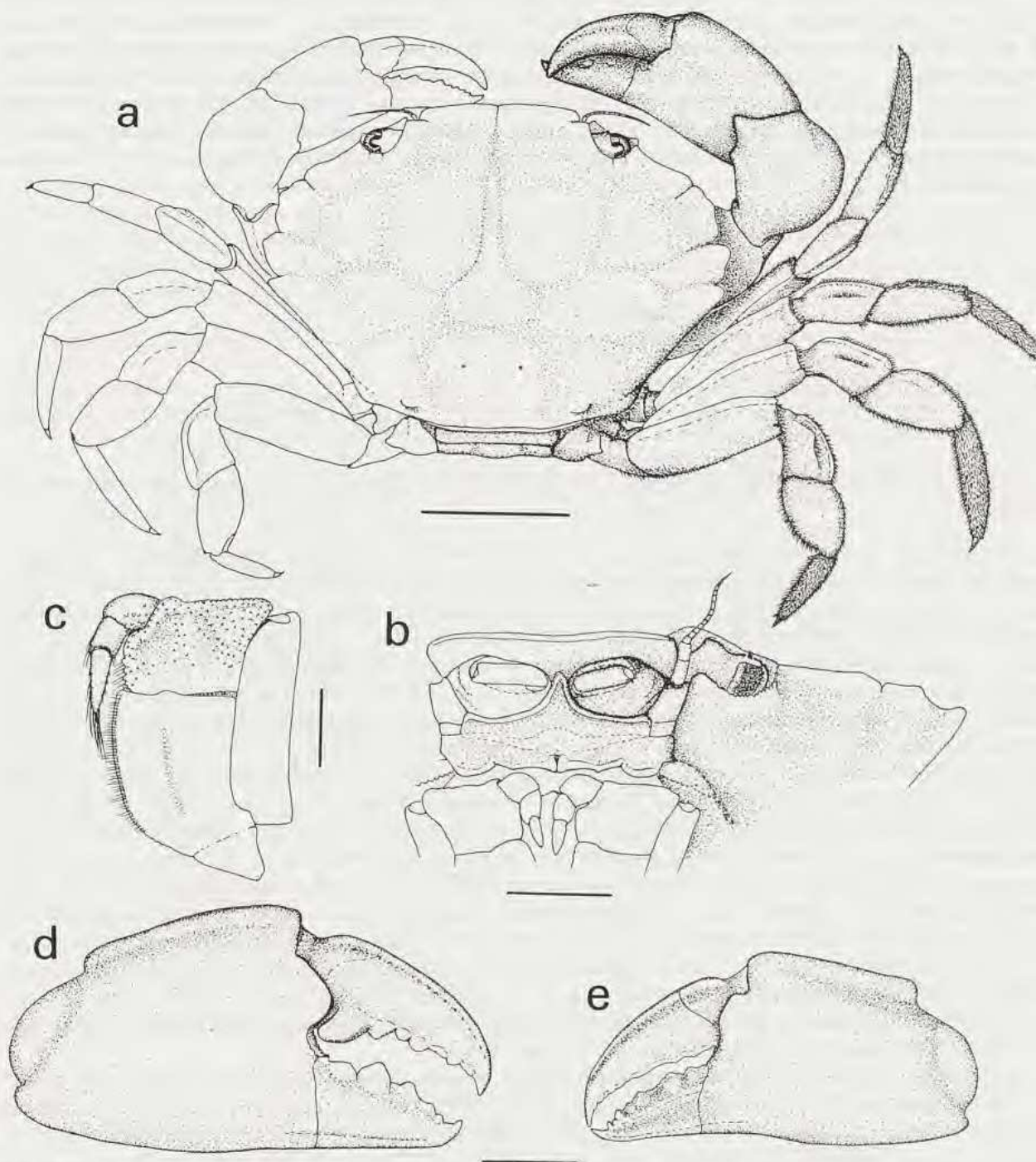


FIG. 12. — *Euryxanthops latifrons* sp. nov., holotype : a, dorsal view; b, frontal view; c, third maxilliped; d, right chela; e, left chela. Scale line a = 5 mm; b, d, e = 2 mm; c = 1 mm.

REMARKS. — *E. latifrons* sp. nov. fits perfectly the generic diagnosis of GARTH & KIM (1983) especially in the shape and cresting of the anterolateral margins, the crested walking legs, the relatively poorly defined carapace regions, and the unequal chelipeds. Unfortunately as the only available specimen is a female it is impossible to check the structure of the gonopods.



*Euryxanthops latifrons* can be separated from all other species using the characters given in the key provided here. It is closest in appearance to *E. dorsiconvexus* and *E. orientalis*. It is immediately separable from *E. dorsiconvexus* by having shorter, broader, walking legs, and by this character it is very similar to *E. orientalis*. It differs from *E. orientalis* by : 1) having a relatively broader, straight, non-protruding front, with only a very small median incision (frontal width *c.* 0.34 times carapace width versus *c.* 0.27 times in *E. orientalis*); 2) by having less conspicuous carapace regions, especially in having 2M entire and not anteriorly divided; 3) by having the anterolateral margin behind the exorbital angle more strongly obliquely sloping, whereas in *E. orientalis* it is relatively flatter.

DISTRIBUTION. — Only known from the Loyalty Islands, from 261 m depth.

*Euryxanthops cepros* sp. nov.

Figs 13, 17c, e-f

MATERIAL EXAMINED. — **Seychelles**. CEPROS : stn 12.63, 05°10.0'S, 57°04.3'E, 250-300 m, trapped, 31.10.1987 : 1 ♂ 26.7 x 18.5 mm (MNHN-B 22776); 1 ♂ 31.3 x 21.7 mm, 2 ♀ 19.5 x 13.5, 23.3 x 16.1 mm (MNHN-B 22777); 1 ♀ 25.1 x 17.3 mm (USNM); 1 ♂ 29.3 x 20.3 mm (QM-W 20580).

TYPE SPECIMENS. — The male, 26.7 x 18.5 mm (MNHN-B 22776), is the holotype; other specimens are paratypes.

DESCRIPTION. — *Carapace*. Transversely ovoid, *c.* 1.45 times broader than long; appearing smooth but microscopically granular, without setae; convex anteriorly, more-or-less flat from side to side across postero-branchial regions. Regions poorly indicated, mostly marked by broad shallow smooth grooves; 1F and 2F not demarcated, marked by shallow depression; 1M barely indicated, 2M broad, entire; anterior prolongation of 3M clearly marked, narrow, slightly convex margins, posteriorly 3M less clearly marked; moderately deep, well defined, lateral gastro-cardiac and cardio-intestinal depressions; 4M not separated; 1L, 2L and 3L confluent; 4L, 5L confluent; 6L scarcely defined; 1R, 2R, 3R confluent; 1P, 2P almost confluent. Anterolateral border of carapace crested and upturned; divided into four lobes separated by small notches; first lobe slightly the largest, confluent with exorbital angle, inner two-thirds more-or-less horizontal; second and third lobes reducing in length; fourth lobe merely an obtuse tooth. Posterolateral border slightly sinuous, longer than anterolateral. Posterior border more-or-less straight. Front noticeably produced, sometimes divided into two slightly convex lobes by small notch, otherwise with a shallow median depression only; laterally strongly separated from prominent supra-orbital angles by a deep, oblique notch. Supra-orbital border smooth, with two lateral closed fissures; infra-orbital border minutely granular, sinuous, with large triangular tooth at inner end just visible dorsally, and deep notch below exorbital angle. Eyestalk with two strong tubercles, and a third low tubercle on extension over cornea. Basal antennal segment minutely granular, in contact with ventral prolongation of front; flagellum about 1.5 times width of orbit. Basal segment of antennule granular laterally, with moderately strong ridges on superior and lateral margins, flagellum folding obliquely.

*Third maxilliped*. Merus about half length of ischium, wider than long, anteroexternal angle moderately produced, bluntly rounded; ischium *c.* 1.4 times longer than wide.

*Chelipeds*. Noticeably unequal, right largest and stoutest; appearing smooth but microscopically granular; with some small punctuations. Merus of right cheliped short, not markedly projecting beyond edge of carapace, generally smooth, upper border sharply crested, crest ending subterminally. Carpus swollen, smoothly rounded, bearing a strong triangular tooth at inner angle, and a smaller tooth below it. Palm high, height *c.* 0.5 times length (including fixed finger); evenly rounded except for broad shallow longitudinal depression before upper margin; immovable finger relatively short and stout, ventral sub-marginal groove, cutting edge with small blunt teeth distally, but broad wide shallowly concave shelf over proximal two fifths. Dactylus longer, stout, rounded, with a broad, blunt longitudinal ridge defined proximally, indicated merely by row of punctuations distally; cutting margin with a few low rounded teeth distally and large, blunt, outwardly and backwardly projecting molar basally. Left cheliped of same form but fingers thinner and cutting margins sharper; dactylus lacking basal molar. Fingers of both chelae black; colour of fixed finger not extending backwards beyond gape.



*Walking legs.* Medium length, first three pairs subequal, fourth pair slightly shorter. Margins of meri, carpi, and propodi sharply crested. Thick tomentum on anterior distal end of carpi, distal half of propodi on anterior and posterior borders, and entire length of dactyli on anterior and posterior borders, completely encircling distally. Third leg of holotype with the following proportions : merus *c.* 3.0 times longer than wide; carpus *c.* 1.95 times longer than wide; propodus 1.65 times longer than wide; dactylus *c.* 1.4 times longer than propodus.

*Sternum and male abdomen.* Sternum with groove separating fused sternites 3/4 strongly incised laterally, and clearly marked across most of width; short deep longitudinal fissure on sternite 4. Male abdomen smooth; segment 3-5 fused but suture lines still evident; telson broadly rounded, *c.* 1.75 times wider than long, subequal in length to sixth; sixth segment sub-rectangular, *c.* 1.8 times wider than long; third segment the widest, laterally triangular.

*Gonopods.* G1 slightly curved and tapering, with flange on abdominal edge; with row of 7-8 long setae near tip; beyond them tip twisted and scoop-like; small sharp conical tubercles over much of length beyond broad base (see Fig. 13e). G2 relatively long, slender, curved, distal part recurved.

**ETYMOLOGY.** — Named after the expedition during which the specimens were collected. It is used as a noun in apposition.

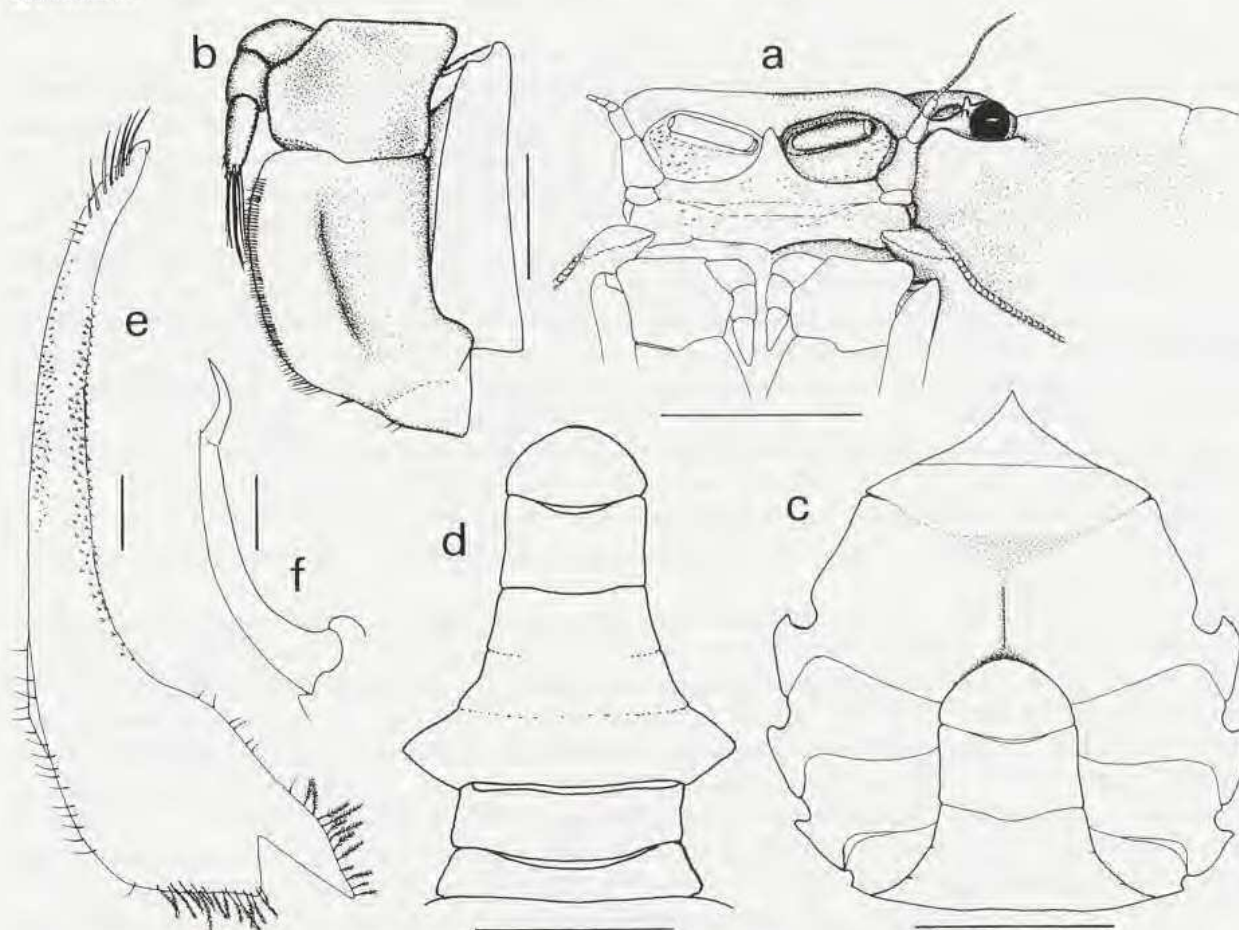


FIG. 13. — *Euryxanthops cepros* sp. nov., holotype : a, frontal view; b, third maxilliped; c, sternum; d, abdomen; e, first gonopod; f, second gonopod. Scale line a, c, d = 5 mm; b = 2 mm; e, f = 0.5 mm.

**REMARKS.** — This is the first species of this genus to be recognised from the Indian Ocean. *Euryxanthops cepros* sp. nov. perfectly fits the generic diagnosis of GARTH & KIM (1983) especially in the shape and cresting of the anterolateral margins, the crested walking legs, the relatively poorly defined carapace regions, the unequal chelipeds and the shape and armature of the gonopods.



*Euryxanthops cepros* differs from all known species by its poorly differentiated anterolateral lobes, which are almost confluent and separated by only small notches. Also it is somewhat broader than the two species from the Philippines, length/breadth ratio of holotypes : 1.44 in *E. cepros* versus 1.36 in *E. dorsiconvexus*, and 1.40 in *E. flexidentatus*. In this regard it agrees precisely with *E. orientalis* (also 1.44).

DISTRIBUTION. — Only known from the Seychelles. Bathymetric range : 250-300 m.

*Xanthias teres* sp. nov.

Fig. 14

MATERIAL EXAMINED. — **Loyalty Islands.** MUSORSTOM 6 : stn DW 399, 20°41.8'S, 167°00.2'E, 282 m, 14.02.1989 : 1 ♂ 8.0 x 6.0 mm (MNHN-B 22786).

TYPE SPECIMEN. — The unique male specimen is the holotype.

DESCRIPTION. — *Carapace*. Transversely ovoid, *c.* 1.33 times broader than long. Carapace convex anteriorly, slightly convex side to side across posterobranchial regions. Regions moderately defined by broad shallow grooves : 1F and 2F not demarcated; 1M just distinguishable beside anterior prolongation of 3M; 2M broad, entire; 3M entire, clearly defined; 4M not separated; 1L, 3L, 4L more or less distinct and confluent with anterolateral teeth, 2L, 5L, 6L confluent; cardiac region broad, oval, poorly defined by shallow depressions; intestinal region narrow. Anterolateral margins regularly convex; with four broadly triangular teeth behind the exorbital angle; second tooth slightly the largest; first tooth connected to exorbital angle by a bluntly rounded crest; posterolateral margins convergent, straight, slightly longer than anterolateral margins. Front *c.* 0.39 times carapace width; not deflexed, slightly projecting; bilobed; distinct median notch; lateral angles rounded, prominent. Carapace surface microscopically granular; without setae. Upper orbital border minutely granular; concave; median and lateral notches poorly marked. Lower orbital border sinuous, granular, broad triangular tooth at inner angle; with V-shaped notch at outer edge. Antennal flagellum fine, reaching beyond outer orbital edge. Basal antennal segment just touching front. Basal antennular segment relatively broad, with raised minutely granulate rim on superior and lateral margins; palp folding slightly obliquely. Epistome with lower margin produced.

*Third maxilliped*. Merus wider than long, length *c.* 0.75 times width; outer surface minutely granulate; antero-external angle slightly produced; *c.* 0.5 times length of ischium. Ischium sub-rectangular, length *c.* 1.4 times breadth; smooth, punctate.

*Chelipeds*. Noticeably unequal, right larger; large and robust; palm height *c.* 0.5 times length including fixed finger. Merus with posterior border convex, granulate, without subterminal tooth; carpus with broad tooth at inner angle; a second, smaller tooth, ventro-proximally; upper and outer surface minutely granular, with broad, shallow, oblique furrow behind chela articulation. Outer surface of palm appearing smooth, but with minute rounded granules; without setae; indistinct sub-dorsal groove; broad rounded longitudinal crest along superior margin. Fixed finger with indistinct ventral ridge; armed with four strong high molars. Ventral border of chela slightly concave at base of fixed finger. Dorsal surface of dactylus finely granular, with broad, rounded, longitudinal crest; cutting margin with teeth increasing in size proximally, basal tooth large, rounded, projecting obliquely backwards and outwards. Fingers pointed, tips crossing. Smaller cheliped of similar form, less robust; longitudinal grooving on palm and fingers more pronounced; cutting margins sharper, and lacking strong basal molar on dactyl. Both chelae with fingers coloured dark brown; colour not extending backwards onto palm.

*Walking legs*. Medium length; compressed; first three pairs of similar length, *c.* 1.3 times maximum carapace width. Merus of third leg *c.* 3.6 times longer than wide; carpus *c.* 2.2 times longer than wide; propodus *c.* 1.9 times longer than wide; dactylus *c.* 1.6 times length of propodus. Dactyli slender, straight, terminating in an acute chitinous recurved tip; thick covering of short setae. Anterior margin of meri armed with small sharp granules. Carpi with an accessory carina on upper surface. Feathered setae on margins, mostly sparse, densest proximally.



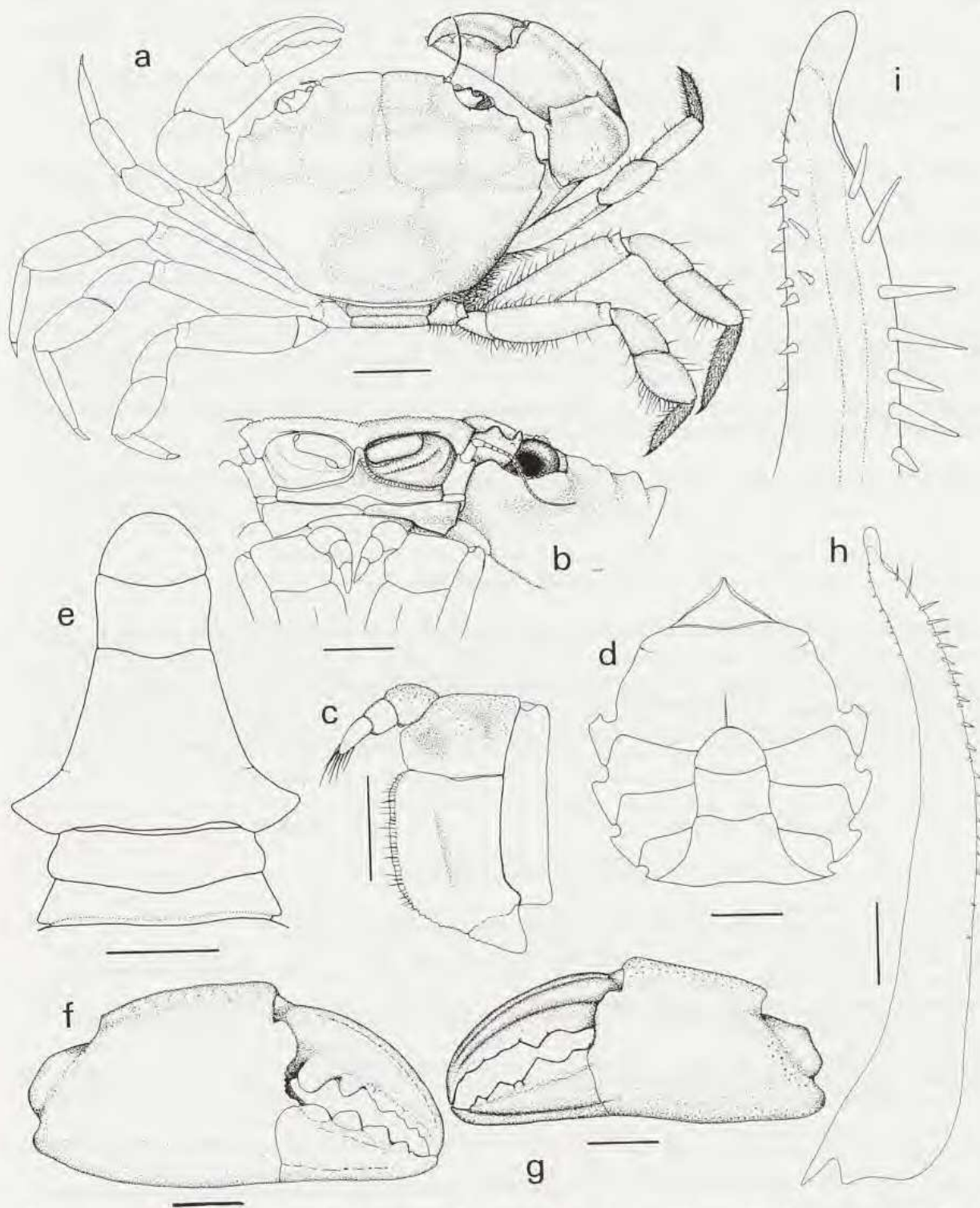


FIG. 14. — *Xanthias teres* sp. nov., holotype: **a**, dorsal view; **b**, frontal view; **c**, third maxilliped; **d**, sternum; **e**, abdomen; **f**, right chela; **g**, left chela; **h-i**, first gonopod and enlargement of tip. Scale line **a** = 2 mm; **b-g** = 1 mm; **h** = 0.5 mm.



*Male abdomen.* Relatively narrow; segments three to five fused; third segment the widest. Segment six c. 1.6 times wider than long; telson length c. 0.7 times width, evenly rounded. Surface smooth, punctuate; covered with short feathered setae, but sparse centrally.

*Gonopods.* G1 relatively long, tapering; apex spatulate; large, stout setae on outer margin commencing below aperture and reducing to small conical setae proximally; small conical setae on inner margin subdistally.

*Sternum* smooth, punctuate. Male sternum with short medial longitudinal incision on sternite 4.

ETYMOLOGY. — The name is from the latin *teres* meaning rubbed-off or rounded, and refers to the very poor definition of the dorsal carapace regions.

REMARKS. — This species falls into the group of species having a smooth carapace, and with four clearly defined, relatively acute, anterolateral teeth. The male G1 does not have the row of long setae on the subdistal margin that is typical of the species of this genus, nevertheless in overall facies it appears to be a true *Xanthias*. Its closest relatives seem to be *X. cherbonnieri* Guinot, 1964, and *X. pachydactylus* (A. Milne Edwards, 1873). It differs from the latter by the form of the male G1 (FOREST & GUINOT, 1961 : fig. 71); but the G1 of *X. cherbonnieri* is still unknown. It differs from both these species by the shape of the anterolateral teeth, and by having the dorsal carapace regions even more poorly defined, such that they are barely obvious, especially across the anterior part of the carapace where they are normally the most prominent.

DISTRIBUTION. — Found only from the type locality in the Loyalty Islands. Taken from a depth of 282 m.

## ACKNOWLEDGMENTS

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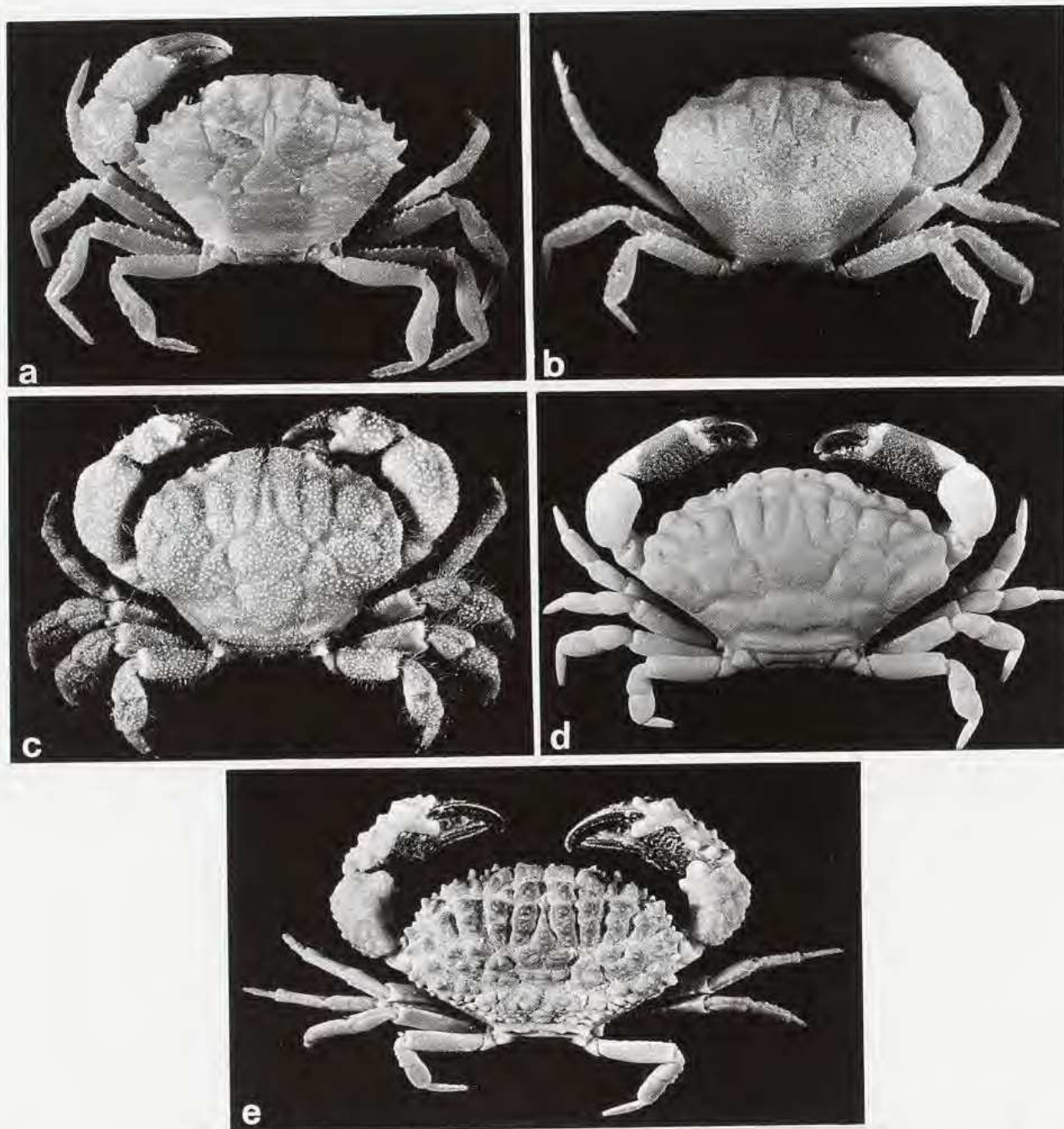


FIG. 15. — a, *Medaeus aztec* sp. nov., ♂ holotype (MNHN-B 22807); b, *Rata chalcal* sp. nov., ♂ holotype (MNHN-B 22803); c, *Gaillardieillus bathus* sp. nov., ♂ holotype (MNHN-B 22771); d, *Liomera nigrimanus* sp. nov., ♂ holotype (MNHN-B 22758); e, *Meractaea multidentata* sp. nov., ♂ holotype (MNHN-B 22760).



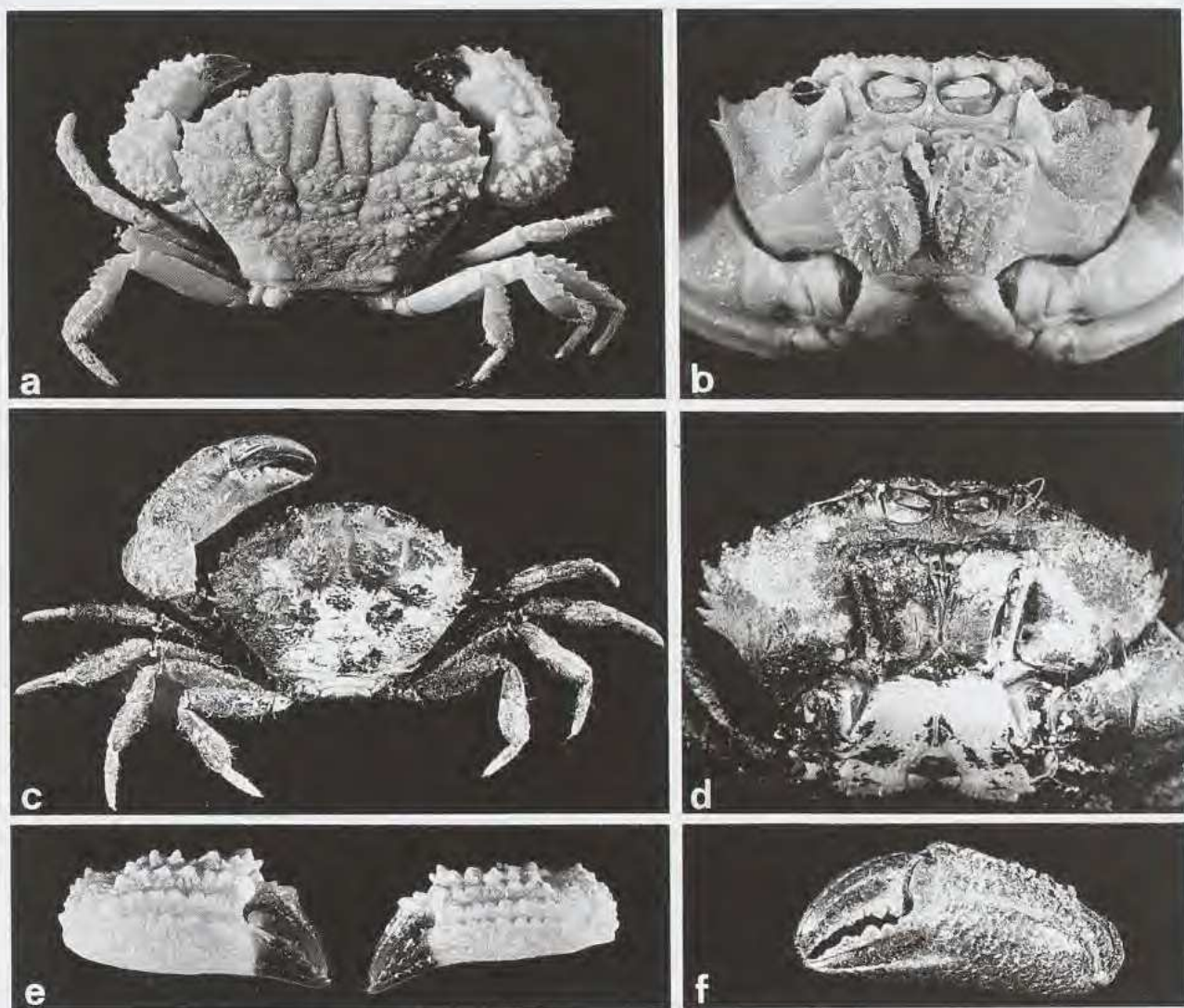


FIG. 16. — a-b, e, *Palatigum trichostoma* gen. nov., sp. nov., ♀ holotype (MNHN-B 22801); c-d, f, *Medaeops gemini* sp. nov., ♂ holotype (MNHN-B 22804).



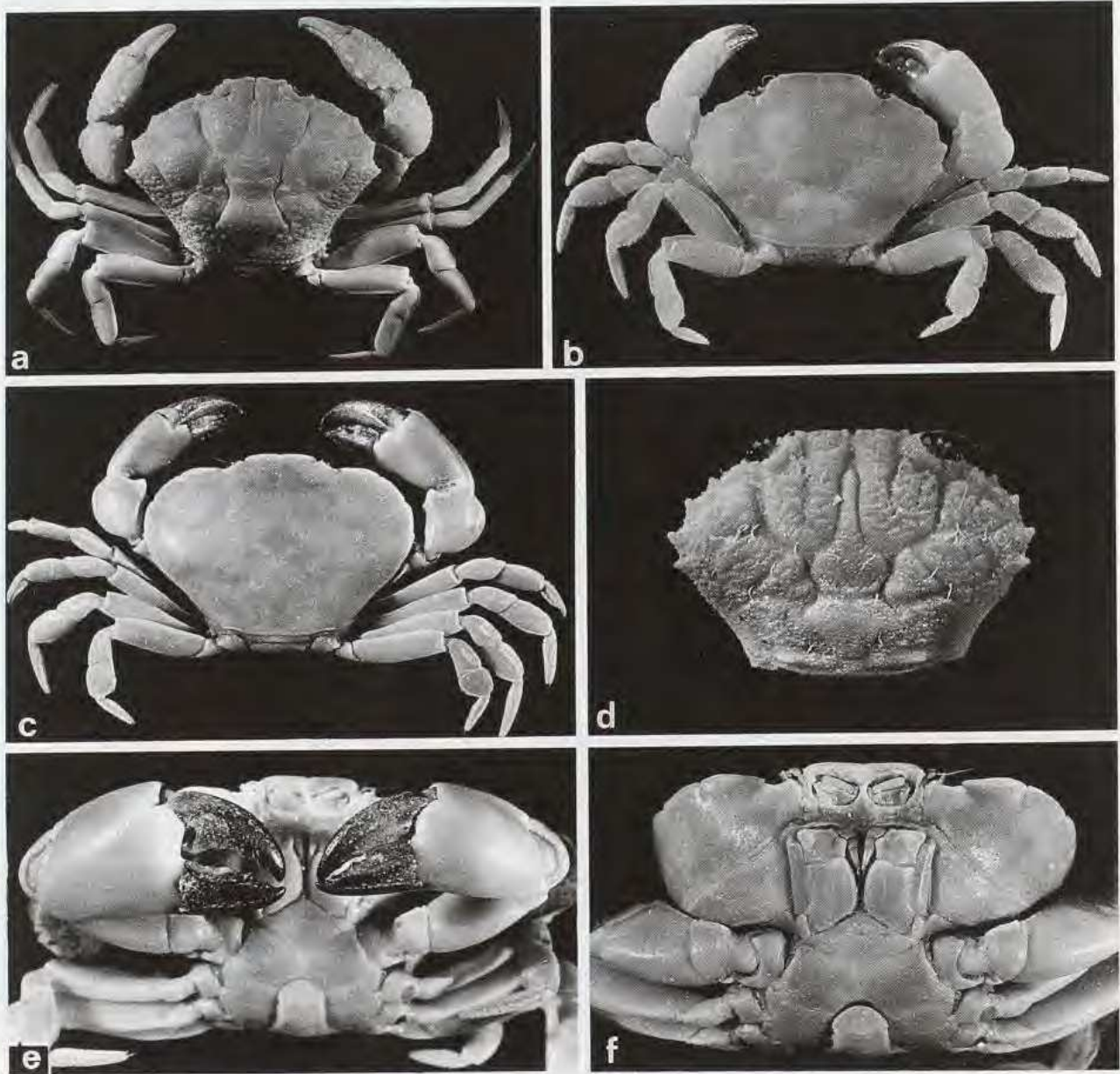


FIG. 17. — a, *Dementia wardi* Garth & Ng, 1985 (MNHN-B 22806); b, *Euryxanthops latifrons* sp. nov., ♀ holotype (MNHN-B 22785); c, e-f, *Euryxanthops cepros* sp. nov., ♂ holotype (MNHN-B 22776); d, *Medaeops merodontos* sp. nov., ? holotype (MNHN-B 22808).



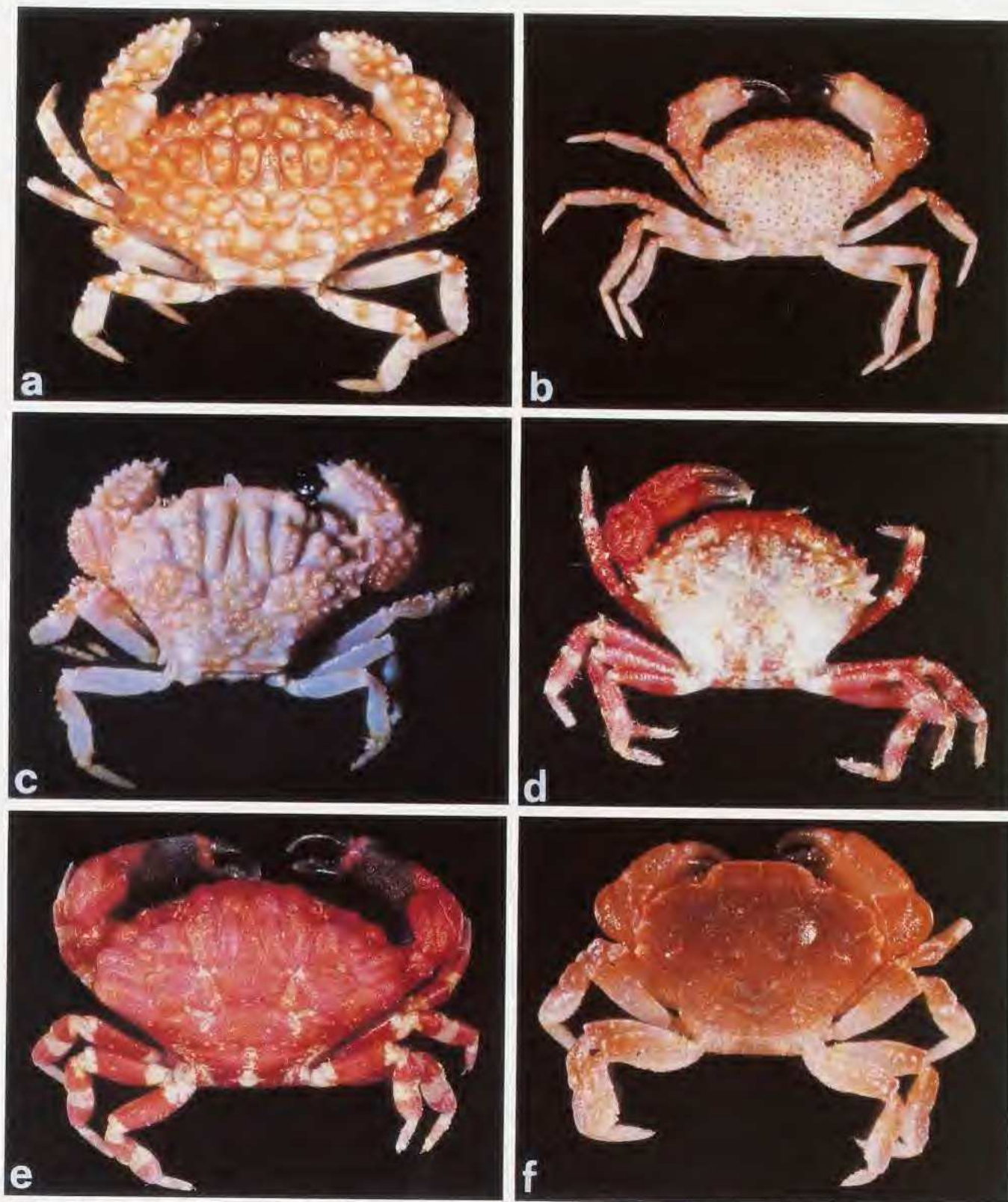


FIG. 18. — a, *Meractaea multidentata* sp. nov., ♀ paratype (MNHN-B 22767); b, *Alainodaeus rimatara* Davie, 1993, ♂ (MNHN-B 22924); c, *Palatigum trichostoma* gen. nov., sp. nov., ♀ (holotype) (MNHN-B 22801); d, *Medaeus aztec* sp. nov., ♂ holotype (MNHN-B 22807); e, *Liomera nigrimanus* sp. nov., ♂ holotype (MNHN-B 22758); f, *Euryxanthops latifrons* sp. nov., ♀ holotype (MNHN-B 22785).